DATA SHEET

برای پروژه ESD سیستم کنترل نگهداشت و افزایش تولید میدان نفتی بینک

شرکت پارس کنترل پیشرو

ESD:EMERSON

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Rev.	**Date**	**POI**	**Prepared by**	**Checked by**	**Approved by**

DeltaV™ Bulk Power Supplies

DeltaV™ 5 A, 10A, 20 A, 40 A Bulk Power Supplies.

DeltaV 20 A, 40 A and 80 A Bulk Power Supply Redundancy Modules.

- Easy to use
- Improved availability
- Flexible and cost effective
- Small footprint

Introduction

Power — your system won't operate without it. DeltaV™ Bulk Power Supplies offer you the *most efficient and reliable power solution* for your money. The DeltaV Bulk Power Supply suite provides power to the system electronics and to the field. This is all the power required for your DeltaV system.

Benefits

Easy to use. The DeltaV Bulk Power Supplies provide reliable 12 and 24 V DC power for your DeltaV system power and bussed field power needs. They mount easily onto a T-type DIN rail—*easy!*

Improved availability. Redundancy modules based on active MOSFET technology offer significantly higher efficiencies and lower voltage drop than traditional diode based modules, leading to less heat dissipation and better system reliability.

Flexible and cost effective. The DeltaV Bulk Power Supplies are flexible to use and cost effective, as external redundancy modules can be applied, for example, if load sharing is desired. Models are available both with and without conformal coating.

Small footprint. The DeltaV Bulk Power Supplies provide very competitive small footprints!

Hardware Specifications

Common Environmental Specifications*	
Operational Temperature**	-40 to + 70°C (-40 to 158°F) with linear derating to 75% power from 60 to 70°C
Storage Temperature	-40 to + 85°C (-40 to 185°F)
Relative Humidity	5 to 95%, non-condensing
Protection Rating	IP20
Airborne Contaminants	ISA-S71.04-1985 airborne contaminants class G3, Conformal coating***
Shock	10(g) RMS, three axes, 11ms for each axis
Vibration	2.5(g) RMS, 10-2000 Hz (random); three axes for 20 minutes each - IEC 60068-2-6
Mounting	Mount only on horizontally-oriented DIN Rail, with label text right-side up

*VE5139 and VE5140 have different environmental specs, see specifications for those models below.

Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper for more information.

***Only applies to conformal coated models, see ordering information for more details.

Certificates and Compliances*	Listed, Ind. Control Equipment, E61379 – UL 508, CSA C22.2 No 107.1 UL Recognized Component, ITE, E137632 – UL 60950-1/CSA C22.2 No. 60950-1, 2nd Edition Low Voltage Directive – IEC/EN60950-1, 2nd Edition UL Recognized Component, Haz. Loc., E234790 – UL60079-15/CSA E60079-15 – Class I, Div 2, Ex nA nC IIC ATEX Directive – EN60079-0, EN60079-7, EN60079-15 – II 3 G, Ex ec nC IIC Gc IECEx Certified – IEC 60079-0, IEC 60079-7, IEC 60079-15 – Ex ec nC IIC Gc – ExEAC TR CU 012/2011 Safety of Equipment intended for Explosive Atmospheres ABS Type Approval DNV-GL Type Approval

*Refer to user manual for installation requirements when used in hazardous locations. VE5139 and VE5140 doesn't have hazardous area or marine certifications.

DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 5 A

Description	DeltaV Bulk AC to 24 V DC, 5 A Power Supply Specifications
Output Voltage	24 V DC
Output Voltage Adjustment Range	23.5 - 28.5 V DC
General Protection/Safety	Output is SELV (Safety Extra Low Voltage)
Output Current	5A 1.5 × Nominal Current for > 4 seconds minimum while holding voltage > 20 V DC
Output Power	120 W 180 W for 4 seconds minimum while holding voltage > 20 V DC
Output Ripple	Typ. < 50 mV peak-to-peak from 0Hz to 20MHz
Output Hold-up Time	>20 ms (Full load, 100-230 V AC Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	43 - 67 Hz
AC Input Current	1.65 A at 85 V AC 0.55 A at 264 V AC
AC Power Factor Correction	Active power factor correction typ. 0.98 @ 115V AC/ 0.92 @ 230 V AC
AC Inrush Current	Typ. <3.7A at 120V AC, < 7.4A at 230V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 88% typ.
AC Losses	14 W typ.
DC Input Voltage	100 – 340 V nominal (90 - 375 V range)
DC Input Current	1.65 at 90 V DC 0.55 A at 375 V DC

Input Protection	Internally fused, non-replaceable fuses. ***Note:*** *The internal fuse is for an internal fault condition only. Shorts and overload will not cause the fuse to fail.*
Alarm Relay Contact Rating	N.O. contact rated 200mA/50 V DC, Signal Active when Vout> 18.5 V DC +/-5%
Dimensions	Height: 123 mm (4.85 in) Width: 50 mm (1.97 in) Depth: 110 mm (4.36 in)
Weight	1.3 lb (0.6 kg)
Free Spacing	Above & Below 25 mm (0.98 in) Left & Right 10 mm (0.39 in) Front 15 mm (0.59 in)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG
Screw Torque	4.4 lb-in (50 N-cm)	6 lb-in (68 N-cm)	6 lb-in (68 N-cm)

DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 10 A

Description	DeltaV Bulk AC to 24 V DC, 10 A Power Supply Specifications
Output Voltage	24 V DC
Output Voltage Adjustment Range	23.5 - 28.5 V DC
General Protection/Safety	Output is SELV (Safety Extra Low Voltage)
Output Current	10A 1.5 × Nominal Current for > 4 seconds minimum while holding voltage > 20 V DC
Output Power	240 W 360 W for 4 seconds minimum while holding voltage > 20 V DC
Output Ripple	Typ. < 50 mV peak-to-peak from 0Hz to 20MHz
Output Hold-up Time	>20 ms (Full load, 100-230V AC Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	43 - 67 Hz
AC Input Current	3.2 A at 85 V AC 1.0 A at 264 V AC
AC Power Factor Correction	Active power factor correction typ. 0.98 @ 115 V AC/ 0.92 @ 230 V AC
AC Inrush Current	Typ. <12.7A at 120 V AC, < 24.8A at 230V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 90% typ.
AC Losses	24 W typ.
DC Input Voltage	100 – 340 V nominal (90 - 375 V range)
DC Input Current	3.2 at 90 V DC 1.0 A at 375 V DC

Input Protection	Internally fused, non-replaceable fuses. ***Note:*** *The internal fuse is for an internal fault condition only. Shorts and overload will not cause the fuse to fail.*
Alarm Relay Contact Rating	N.O. contact rated 200mA/50 V DC, Signal Active when Vout> 18.5 V DC +/-5%
Dimensions	Height: 123 mm (4.85 in) Width: 60 mm (2.36 in) Depth: 110 mm (4.36 in)
Weight	1.7 lb (0.8 kg)
Free Spacing	Above & Below 25 mm (0.98 in) Left & Right 10 mm (0.39 in) Front 15 mm (0.59 in)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG
Screw Torque	4.4 lb-in (50 N-cm)	6 lb-in (68 N-cm)	6 lb-in (68 N-cm)

DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 20 A

Description	DeltaV Bulk AC to 24 V DC, 20 A Power Supply Specifications
Output Voltage	24 V DC
Output Voltage Adjustment Range	23.5 - 28.5 V DC
General Protection/Safety	Output is SELV (Safety Extra Low Voltage)
Output Current	20A 1.5 × Nominal Current for > 4 seconds minimum while holding voltage > 20 V DC
Output Power	480 W 720 W for 4 seconds minimum while holding voltage > 20 V DC
Output Ripple	Typ. < 100 mV peak-to-peak from 0Hz to 20MHz
Output Hold-up Time	>20 ms (Full load, 100-230 V AC Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	43 - 67 Hz
AC Input Current	6 A at 85 V AC 3 A at 264 V AC
AC Power Factor Correction	Active power factor correction typ. 0.98 @ 115V AC/ 0.92 @ 230 V AC
AC Inrush Current	Typ. <5.8A at 120 V AC, < 11.5A at 230 V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 92% typ.
AC Losses	38 W typ.
DC Input Voltage	100 – 250 V nominal (90 - 275 V range)
DC Input Current	6 A at 90 V DC 3 A at 275 V DC

Input Protection	Internally fused, non-replaceable fuses. ***Note:*** *The internal fuse is for an internal fault condition only. Shorts and overload will not cause the fuse to fail.*
Alarm Relay Contact Rating	N.O. contact rated 200mA/50 V DC, Signal Active when Vout> 18.5 V DC +/-5%
Dimensions	Height: 123 mm (4.85 in) Width: 87 mm (3.42 in) Depth: 127 mm (4.98 in)
Weight	3.0 lb (1.4 kg)
Free Spacing	Above & Below 40 mm (1.6 in) Left & Right 10 mm (0.39 in) Front 15 mm (0.59 in)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG
Screw Torque	4.4 lb-in (50 N-cm)	7 lb-in (80 N-cm)	7 lb-in (80 N-cm

DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 40 A

Description	DeltaV Bulk AC to 24 V DC, 40 A Power Supply Specifications
Output Voltage	24 V DC
Output Voltage Adjustment Range	23.5 - 28.5 V DC
General Protection/Safety	Output is SELV (Safety Extra Low Voltage)
Output Current	40A 1.5 × Nominal Current for > 4 seconds minimum while holding voltage > 20 V DC
Output Power	960 W 1,440 W for 4 seconds minimum while holding voltage > 20 V DC
Output Ripple	Typ. < 200 mV peak-to-peak from 0Hz to 20MHz
Output Hold-up Time	>20 ms (Full load, 100-230 V AC Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	43 - 67 Hz
AC Input Current	12 A at 85 V AC 4 A at 264 V AC
AC Power Factor Correction	Active power factor correction typ. 0.98 @ 115V AC/ 0.92 @ 230V AC
AC Inrush Current	Typ. <5.8A at 120V AC, < 11.5A at 230V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 93% typ.
AC Losses	67 W typ.
DC Input Voltage	120 – 340 V nominal (108 - 375 V range)
DC Input Current	12 A at 108 V DC 4 A at 375 V DC

Input Protection	Internally fused, non-replaceable fuses. ***Note:*** *The internal fuse is for an internal fault condition only. Shorts and overload will not cause the fuse to fail.*
Alarm Relay Contact Rating	N.O. contact rated 200mA/50 V DC, Signal Active when Vout> 18.5 V DC +/-5%
Dimensions	Height: 123 mm (4.85 in) Width: 180 mm (7.09 in) Depth: 122 mm (4.81 in)
Weight	6.0 lb (2.8 kg)
Free Spacing	Above & Below 25 mm (0.98 in) Left & Right 15 mm (0.59 in) Front 15 mm (0.59 in)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	2.5-6 mm^2 14-10 AWG	10.6-13 mm^2 7-6 AWG	0.14-2 mm^2 26-14 AWG
Screw Torque	4.4 lb-in (50 N-cm)	15.6 lb-in (176 N-cm)	1.7 lb-in (20 N-cm)

DeltaV Bulk Power Supply 100-240 V AC to 12 V DC, 15A

Description	DeltaV Bulk AC to 12 V DC, 15 A Power Supply Specifications
Output Voltage	12 V DC
Output Voltage Adjustment Range	11.5 - 15.5 V DC
General Protection/Safety	Output is SELV (Safety Extra Low Voltage)
Output Current	15A 1.5 × Nominal Current for > 4 seconds minimum while holding voltage > 10 V DC
Output Power	180 W 270 W for 4 seconds minimum while holding voltage > 10 V DC
Output Ripple	Typ. < 100 mV peak-to-peak from 0Hz to 20MHz
Output Hold-up Time	>80ms (Full load, 100 V AC Input @ T =+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	43 - 67 Hz
AC Input Current	1.77 A at 85 V AC 0.9 A at 264 V AC
AC Power Factor Correction	Active power factor correction typ. 0.98 @ 115V AC/ 0.95 @ 230V AC
AC Inrush Current	Typ. <5.8A at 120 V AC, < 12.7A at 230 V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 86.5% typ.
AC Losses	24 W typ.
DC Input Voltage	100 – 340 V nominal (90 - 375 V range)
DC Input Current	1.77 A at 90 V DC 0.9 A at 375 V DC

Input Protection	Internally fused, non-replaceable fuses. ***Note:*** *The internal fuse is for an internal fault condition only. Shorts and overload will not cause the fuse to fail.*
Alarm Relay Contact Rating	N.O. contact rated 200mA/50 V DC, Signal Active when Vout> 90% of output voltage
Dimensions	Height: 123 mm (4.85 in) Width: 60 mm (2.36 in) Depth: 110 mm (4.36 in)
Weight	1.76 lb (0.8 kg)
Free Spacing	Above & Below 25 mm (0.98 in) Left & Right 10 mm (0.39 in) Front 15 mm (0.59 in)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG	1.5-6 mm^2 16-10 AWG
Screw Torque	4.4 lb-in (50 N-cm)	6 lb-in (68 N-cm)	6 lb-in (68 N-cm)

DeltaV Bulk Power Supply Redundancy Module, 12 V DC to 28 V DC, 20 A

Description	Redundancy Module 12 to 28 V DC, 20 A Specifications
Input Voltage	12-28 V DC
Input Voltage Range	10.8-30.8 V DC
Nominal Input Current	2 x 10A, 1 x 20A (-40°C to +70°C) 2 x 12A , 1 x 24A (-40°C to +60°C) 2 x 12.5A, 1 x 25A (-40°C to +50°C) 2 x 13A, 1 x 26A (-40°C to +40°C)
Output Current	0-26 A continuous 26-50 A for 5 seconds 26 A continuous overload/short circuit
Input to Output Voltage Drop	0.2V Typical
Power Losses	0.5 mW at no load (typical) 0.64 mW at 2 x 5 A input (typical) 0.82 mW at 1 x 10 A input (typical) 2.08 W at 2 x 10 A input (typical)
Alarm Relay Contact Rating	N.O. DC OK Contact 60 V DC max @1A
Dimensions	Height: 123.2 mm (4.85 in) Width: 35 mm (1.38 in) Depth: 113.3 mm (4.46 in)
Weight	0.8 lb (0.36 kg)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	3.3-5.3 mm^2 12-10 AWG	8.4-13.3 mm^2 8-6 AWG	0.33-3.3 mm^2 22-12 AWG
Screw Torque	7 lb-inch (79.1 N-cm)	15.6 lb-in (176 N-cm)	4.4 lb-inch (49.7 N-cm)

DeltaV Bulk Power Supply Redundancy Module, 12 V DC to 28 V DC, 40 A

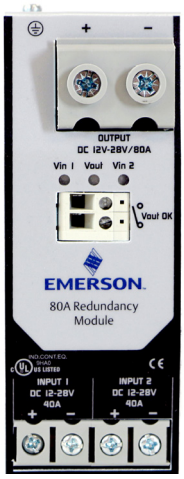
Description	Redundancy Module 12 to 28 V DC, 40 A Specifications
Input Voltage	12-28 V DC
Input Voltage Range	10.8-30.8 V DC
Nominal Input Current	2 x 20A, 1 x 40A (-40°C to +70°C) 2 x 24A , 1 x 48A (-40°C to +60°C) 2 x 25A, 1 x 50A (-40°C to +50°C) 2 x 26A, 1 x 52A (-40°C to +40°C)
Output Current	0-40 A continuous 40-65 A for 5 seconds 40 A continuous overload/short circuit
Input to Output Voltage Drop	0.2V Typical
Power Losses	0.5 mW at no load (typical) 2.08 W at 2x 10 A input (typical) 2.32 W at 1x 20 A input (typical) 7.68 W at 2x 20 A input (typical)
Alarm Relay Contact Rating	N.O. DC OK Contact 60 V DC max @1A
Dimensions	Height: 123.2 mm (4.85 in) Width: 35 mm (1.38 in) Depth: 113.3 mm (4.46 in)
Weight	0.8 lb (0.36 kg)

Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	3.3-5.3 mm^2 12-10 AWG	8.4-13.3 mm^2 8-6 AWG	0.33-3.3 mm^2 22-12 AWG
Screw Torque	7 lb-inch (79.1 N-cm)	15.6 lb-in (176 N-cm)	4.4 lb-inch (49.7 N-cm)

DeltaV Bulk Power Supply Redundancy Module, 12 V DC to 28 V DC, 80 A

Description	Redundancy Module 12 to 28 V DC, 80 A Specifications
Input Voltage	12-28 V DC
Input Voltage Range	10.8-30.8 V DC
Nominal Input Current	2 x 35A, 1 x 70A (-40°C to +70°C) 2 x 40A , 1 x 80A (-40°C to +60°C) 2 x 42.5A, 1 x 85A (-40°C to +50°C) 2 x 45A, 1 x 90A (-40°C to +40°C)
Output Current	0-80 A continuous 80-120 A for 5 seconds 80 A continuous overload/short circuit
Input to Output Voltage Drop	0.2V Typical
Power Losses	1.18 mW at no load (typical) 4.88 W at 2x 20 A input (typical) 6.08 W at 1x 40 A input (typical) 14.24 W at 2x 40 A input (typical)
Alarm Relay Contact Rating	N.O. DC OK Contact 60 V DC max @1A
Dimensions	Height: 123.2 mm (4.85 in) Width: 46 mm (1.81 in) Depth: 117 mm (4.61 in)
Weight	1.1 lb (0.48 kg)



Terminals and Wiring

	Input Screw-Type Terminals	Output Screw-Type Terminals	DC-OK-Signal Screw-Type Terminals
Solid & Stranded Wire	8.4-13.3 mm^2 8-6 AWG	13.3-33.6 mm^2 6-2 AWG	0.33-3.3 mm^2 22-12 AWG
Screw Torque	15.6 lb-in (176 N-cm)	33.6 lb-in (380 N-cm)	4.4 lb-inch (49.7 N-cm)

Common Environmental Specifications for VE5139 and VE5140	
Operational Temperature*	-40** to + 70°C (-40 to 158°F) with linear derating to 50% power from 60 to 70°C No forced air required. Unit should be mounted on a vertical panel, with front label in proper orientation.
Storage Temperature	-40 to + 85°C (-40 to 185°F)
Relative Humidity	Up to 100% RH with condensation
Protection Rating	IP66/67
Shock	Operating: 4 g peak, 22 ms half-sine pulse (IEC 68-2-27) Non-operating: 30 g peak, 18 ms half-sine pulse (IEC 68-2-27).
Vibration	1 g non-operating swept sine over 10–500 Hz (IEC 60068-2-6). Non-operating random vibration test: 1.87 g over 10–500 Hz (IEC 60068-2-64). Operating random vibration test: 0.15 g over 5–100 Hz (IEC 60068-2-64)
Mounting	Chassis mounted using integral mounting tabs. Recommended Screw Size: M4 x 0.7. Tightening Torque: 1N-m

*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper** for more information.

** -25°C for Dual 3.8A model.

DeltaV Bulk Power Supply 100-240V AC to 24V DC, 3.8A, IP67

Description	DeltaV Bulk AC to 24 VDC, 3.8A, IP67 Power Supply Specifications
AC Power Factor Correction	0.95
AC Inrush Current	Typ. <4.86A at 120V AC, < 7.38A at 230V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 80% typ.
AC Losses	12.9 – 22.7W typ.
DC Input Voltage	100 - 353V DC
DC Input Current	1.2A at 100 V DC 0.35A at 353 V DC
Output Voltage	24 V DC
Output Current	3.8A
Output Power	100 W
Output Ripple	Typ. < 50 mV peak-to-peak
Output Hold-up Time	> 50 ms (Full load, 100 Vac Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	50/60 Hz
AC Input Current	1.6 A at 85 V AC 0.7 A at 264 V AC

Fusing - Input - Output	 Internally fused, non-replaceable fuses. Electronically current limited to meet NEC Class 2 per UL1310.
Case	IP66/67 versatile ingress protection.
Connections	An accessible disconnect device shall be installed external to the equipment. Input: 3-PIN IP67 molded plug (quick disconnect). Output: 4-PIN IP67 molded receptacle (quick disconnect). Use UL 758 wire rated min. 24 V, VW-1/FT-1, max. 3.05 m.
Dimensions	Height: 120.1 mm (4.73 in) Width: 177.8 mm (7.00 in) Depth: 45.7 mm (1.80 in)
Weight	2.2 lb (1.0 kg)
Free Spacing	0.39 in. (10 mm) all sides but base

DeltaV Bulk Power Supply 100-240 VAC to 24 VDC, Dual 3.8A, IP67

Description	DeltaV Bulk AC to 24 VDC, Dual 3.8A, IP67 Power Supply Specifications
Output Voltage	24 V DC
Output Current	7.6A Total (3.8A max. per supply)
Output Power	2 X 100 W
Output Ripple	Typ. < 50 mV peak-to-peak
Output Hold-up Time	> 50 ms (Full load, 100 Vac Input @ Tamb=+25°C) to 95% output voltage
AC Input Voltage	100-240V nominal (85 – 264 V range)
AC Mains Frequency	50/60 Hz
AC Input Current	2.57A at 85V AC 0.82A at 264V AC
AC Power Factor Correction	0.95
AC Inrush Current	Typ. 8.8A at 120V AC, < 19.0A at 230V AC, measured at 25°C, Typ. <5 milliseconds
AC Efficiency	> 85% typ.
AC Losses	23.0 – 31.0W typ.
DC Input Voltage	100 - 353V DC
DC Input Current	2.4A at 100V DC 0.7A at 353V DC
Fusing - Input - Output	 Internally fused, non-replaceable fuses. Electronically current limited to meet NEC Class 2 per UL1310
Case	IP66/67 versatile ingress protection.

Connections	An accessible disconnect device shall be installed external to the equipment. Input: 3-PIN IP67 molded plug (quick disconnect). Output: 4-PIN IP67 molded receptacle (quick disconnect). Use UL 758 wire rated min. 24 V, VW-1/FT-1, max. 3.05 m.
Dimensions	Height: 120.1 mm (4.73 in) Width: 177.8 mm (7.00 in) Depth: 83.0 mm (3.27 in)
Weight	3.3 lb (1.5 kg)
Free Spacing	1 in. (25 mm) all sides but base

Ordering Information

DeltaV Bulk Power Supplies	
Description	**Model Number**
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 5A	VE5138
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 10A	VE5123
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 20A	VE5126
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 40A	VE5128
DeltaV Bulk Power Supply 100-240 V AC to 12 V DC, 15A	VE5137
DeltaV Bulk Power Supply Redundancy Module,12-28V, 20A	VE5134
DeltaV Bulk Power Supply Redundancy Module,12-28V, 40A	VE5135
DeltaV Bulk Power Supply Redundancy Module,12-28V, 80A	VE5136
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 5A, conformal coating	VE5122
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 10A, conformal coating	VE5124
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 20A, conformal coating	VE5127
DeltaV Bulk Power Supply 100-240 V AC to 24 V DC, 40A, conformal coating	VE5129
DeltaV Bulk Power Supply 100-240 V AC to 12 V DC, 15A, 12V, conformal coating	VE5121
DeltaV Bulk Power Supply Redundancy Module,12-28V, 20A, conformal coating	VE5131
DeltaV Bulk Power Supply Redundancy Module,12-28V, 40A, conformal coating	VE5132
DeltaV Bulk Power Supply Redundancy Module,12-28V, 80A, conformal coating	VE5133
DeltaV Bulk Power Supply 100-240 VAC to 24 VDC, 3.8A, IP67	VE5139
DeltaV Bulk Power Supply 100-240 VAC to 24 VDC, Dual 3.8A, IP67	VE5140

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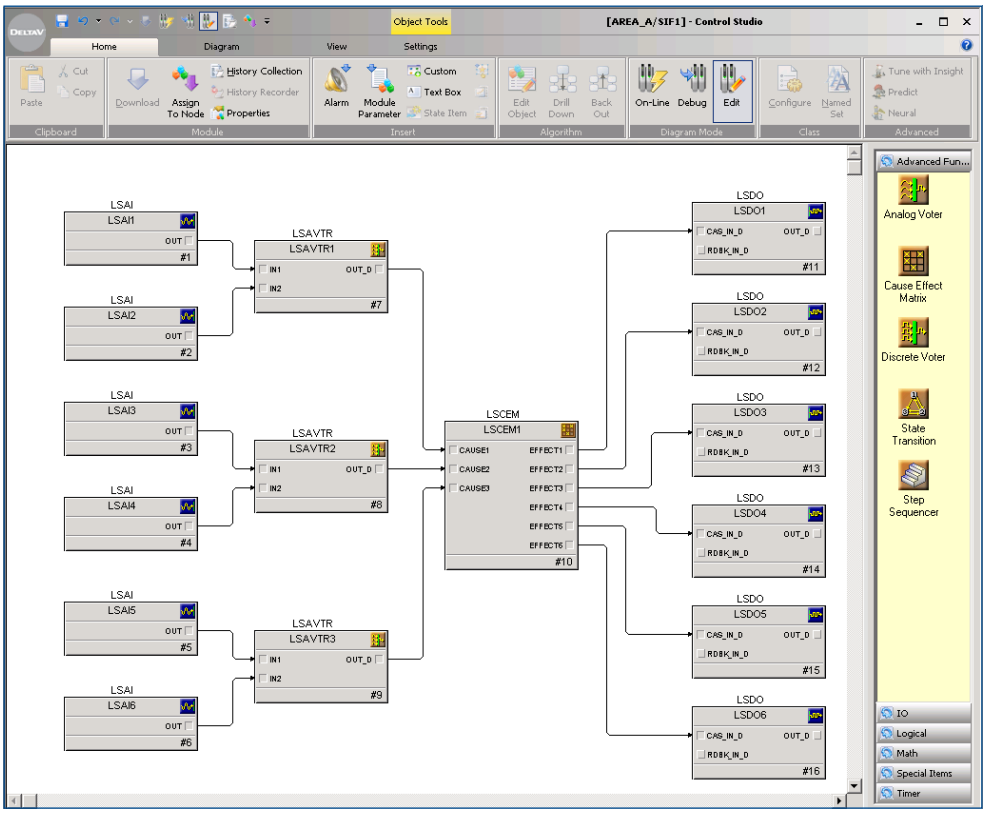
DeltaV SIS™ Engineering Tools



DeltaV SIS™ engineering tools provide an easy, yet powerful configuration environment.

- Powerful functionality, yet easy to use
- IEC 61508 built-for-purpose certified function blocks
- Integrated, role-based user access

Introduction

The DeltaV SIS™ process safety system gives you the benefits of advanced engineering technology, such as drag-and-drop configuration, comprehensive security, and explorer-based software for intuitive project implementation. The DeltaV SIS engineering tools allow you to manage all aspects of your safety system configuration, including hardware configuration, safety loop strategies, built-in change management, and history.

A standards-based approach makes configuring safety instrumented functions (SIF) in the DeltaV SIS system unique. Certified to comply with IEC 61508, the function blocks are designed to make the implementation and management of the safety configuration straightforward and efficient.

The DeltaV SIS built-for-purpose function blocks can help to eliminate engineering hours required to implement safety applications such as Emergency Shut-down (ESD), Fire and Gas systems (FGS), and Burner Management Systems (BMS). The TÜV-certified function blocks deliver powerful functionality out of the box, simplifying the implementation of complex safety instrumented system (SIS) applications.

Other capabilities that make the DeltaV SIS software easy to engineer include:

- Built-in alarm state engine per EEMUA 191standard
- Off-line simulation

Benefits

Reduced Engineering and Complexity

Implement Complex Logic. The logic for safety instrumented functions (SIF) is configured using Control Studio. All of the SIF logic needed for voting, sequencing and/or alarming can be configured in one or more modules with powerful function blocks. A module can contain more than one SIF.

Module templates can also be created for even faster implementation of similar safety loops. Protected modules can be shared between DeltaV SIS systems for reduced complexity in global engineering and IEC 61508 compliance.

IEC 61508 Built-for-purpose Certified Function Blocks. The DeltaV SIS function blocks have been designed to combine industry-leading functionality with remarkable ease-of-use. The function blocks reduce the implemention of voting, cause and effect, and sequencing logic. What formerly took pages of ladder logic and custom programming to engineer, it is now a simple drag-and-drop configuration activity, for easy adherence to the safety standards.The function blocks are built to the IEC 611313 function block diagrams standard and certified by TÜV, making safety logic development both intuitive andeasy.

Consistent approach with all safety applications. No matter what application that DeltaV SIS is used for– whether it‘s emergency shutdown, fire and gas system or burner management systems – all configuration is performed in Control Studio, using the certified function blocks. This consistency enables engineers to more easily configure and troubleshoot all safety loops.

Easy and Flexible User Management. The User Manager tools make user administration easy. Pre-built security groups make it easy to give proper authorization for a specific job, while still making it simpleto modify or to create new groups.

Simplified Safety Lifecycle Management

The real-world requirements of managing a process plant safely have also been addressed. For instance, you need to be sure that the valve will perform on demand.You need to decrease the test frequency of the safety functions from six months to the turnaround scheduled every six years. DeltaV SIS platform provides tools such as scheduled partial stroke testing of valves to meet these requirements. An alarm is generated on partial stroke failure or advanced diagnostic alert detection and the valve is available on demand even while the partial stroke test is in progress.

Voter function blocks provide advanced features like built-in bypasses and deviation alarms to improve plant availability. The voting is configured using radio buttons and check-boxes, with extensible blocks ensuring that the same approach is taken throughout the configuration, regardless of the scale of the application inquestion.

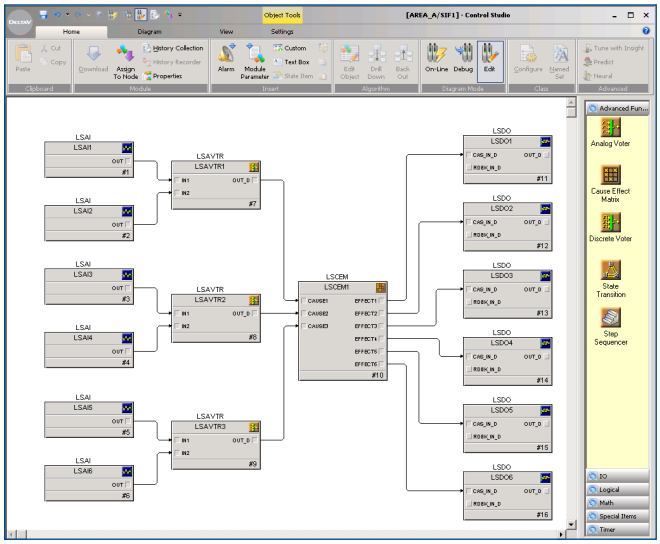
With optionally certified Rosemount transmitters and Fisher Digital Valve Controllers, the DeltaV SIS system and the AMS Device Manager – the architecture is in place. With patented DeltaV SIS function blocks, each one specifically designed to meet an industry need– configuration is a few mouse clicks away. With Control Studio and powerful function blocks – the Safety Integrity Level of the Safety Instrumented Function can be maintained with reduced field tests.

Product Description

SIF are configured in Control Studio and Explorer. Both software applications are intuitive to use, making it easier for novice users to quickly become productive. Additionally, both have online capabilities for easy troubleshooting. User Manager provides the tools to manage user accounts, privileges and passwords.

Control Studio

Safety instrumented functions are graphically assembled and modified using common drag-and-drop techniques. Development is visually intuitive, making it easy for first-time users to quickly become productive. Context-sensitive, online help is available for all functions.



Control Studio is a visual tool for configuring safety loops.

Function Blocks

The function blocks listed and described on subsequent pages are executed within the families of DeltaV SIS logic solvers: Smart Logic Solver (SLS1508) and CHARMs Smart Logic Solver (CSLS).

Explorer

The Explorer application presents the complete system in a single view and enables direct access to any item. Similar in appearance to Microsoft Windows® Explorer,one can view the overall structure and layout of the system.

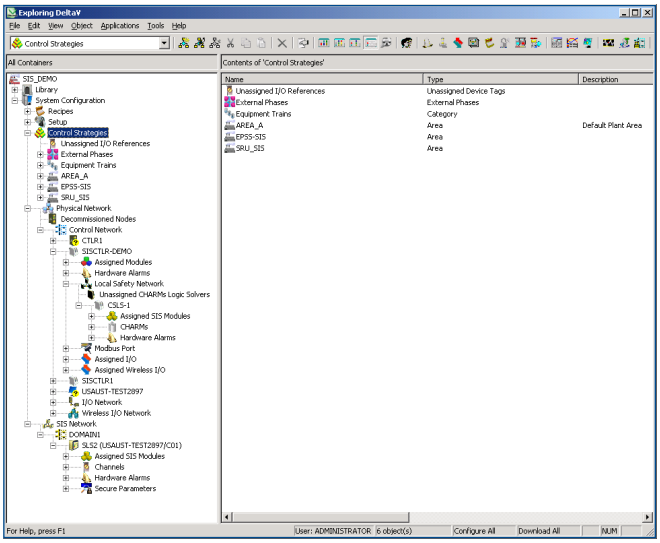
Engineering is simplified with the Explorer auto-sense capability to build your system configuration as you plug in hardware. Logic solvers and HART® devices that are connected to the network will be detected and added to the database with just a couple of clicks.

Templates

Implementation of DeltaV SIS may require multiple similar modules. One or more module templates can be created that capture logic required for several SIFs, rather than create each module from scratch. Each template is copied and then modified as required. Templates can be used within one DeltaV SIS system or transferred to multiple DeltaV SIS systems.

Each DeltaV SIS system includes one SIS module template. This can be used by simply dragging and dropping the template into a plant area. The template contains no function blocks or logic, but contains two alarms to show the recommended way to handle SIF alarm detection. You can modify the template to suit your needs or create your own templates as required and save them in the template library.

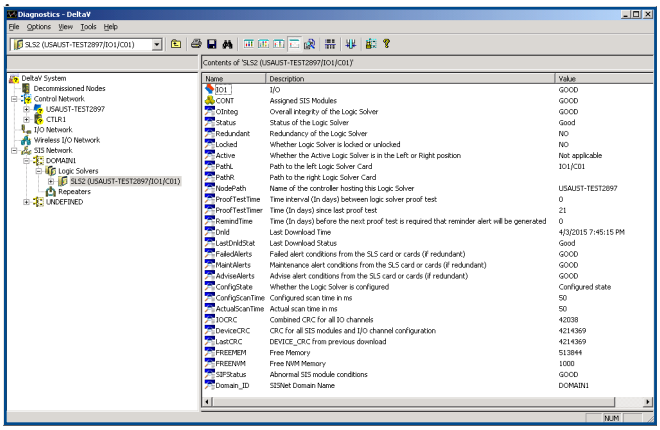
Users can create templates for safety logic on a 'master' DeltaV SIS system and then distribute the templates to engineering centers for implementation. The templates are protected from modification by only allowing changes to occur in the master system.



Explorer provides easy navigation and an intuitive view of the entire DeltaV SIS system.

Diagnostics Explorer

Just as with the configuration view of the Explorer application, Diagnostics Explorer has the same look and feel as Microsoft Windows Explorer. This application is easily accessed from a context menu in Explorer, from the Operator Interface or from the Windows Start menu .



Diagnostics Explorer provides a common view for system-wide diagnostics.

Diagnostics Explorer provides quick access to detailed integrity information on the logic solvers, I/O channels and safety networks. An event log is included, to track the history of diagnostic events while the application is running.

User Manager

DeltaV SIS security is completely user modifiable to match each company‘s security policies. Role-based access provides exactly the right privileges to each user. The User Manager roles support separation of duties for times when management of change procedures require that critical tasks be performed by more than one person. So, for example, a person making a configuration change may not be allowed to implement (download) the change without a second person authorizing the implementation.

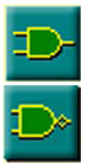
Creating secure user access to workstations includes ensuring that users run under Windows with only those privileges required to do a job. This prevents accidental or deliberate damage to critical workstation files or installation of malware.

The User Manager technology helps to enforce plant security policies such as a requirement for individual log-infor system access. The system can switch users without shutting down critical control applications. Two-factor authentication using Smart Cards is also supported.

DeltaV SIS Function Blocks

Icon	Function Block Description
	**Analog Voter (LSAVTR)** Compares the inputs against a configured limit to determine the output. If an input is greater than (or less than) the configured limit the block counts that as a vote to set the output to Tripped. If the required number of inputs votes to trip, the output of the block goes to tripped value.
	**Discrete Voter (LSDVTR)** Reads each input to determine if it is a vote to trip or not. If the required number of inputs is voting to trip, the output goes to the tripped value.
	**Cause And Effect Matrix (LSCEM)** Executes interlock and permissive logic to associate as many as 16 inputs (causes) with as many as 16 outputs (effects) to control one or more final elements.
	**State Transition Diagram (LSSTD)** Implements a state machine. The block changes state based on the values of its transition inputs.
	**Step Sequencer (LSSEQ)** Drives a number of discrete block outputs based on the input sequence number.

Icon	Function Block Description
	**Monitor Block (LSMON)** Execute interlock and permissive logic to associate as many as 32 inputs with as many as 8 outputs to control other function such as effect blocks *NOTE: Only supported on CSLS firmware version 2 or later*
	**Effect Block (LSEFFECT)** Control one or more final elements based on as many 4 inputs *NOTE: Only supported on CSLS firmware version 2 or later*
	**Analog Input (LSAI)** Reads a single analog signal from an analog input channel and makes it available to other function blocks. The function block performs scaling and provides a square root function for the input data.Analog inputs can be from conventional or HART channels. This function block does not use digital values from HART channels.
	**Discrete Input (LSDI)** Reads a single discrete input from a two-state field device and makes the processed physical input available to other function blocks. You can configure inversion on the input value.
	**Discrete Output (LSDO)** Drives a logic solver discrete output channel to manipulate a solenoid or other final element.
	**Digital Valve Controller (LSDVC)** Connects to Fisher digital valve controllers (DVC 6000 SIS) via a logic solver HART 2-state output channel. Contains all of the parameters found in the Discrete output block plus a set of additional parameters used for partial stroke testing.
	**Alarm (LSALM)** Performs alarm detection on an input. Because the block allows easy access to analog channel data in the Logic Solver, you can choose when alarms are appropriate instead of associating alarming with I/O function blocks.
	**Limit (LSLIM)** Limits an input value between two reference values. The block has options that set the output to a default value or the last value if the input becomes out ofrange.
	**Comparator (LSCMP)** Compares two values and sets a Boolean output based on that comparison. Comparisons are LessThan, Greater Than, Equal To, Not Equal. The block can also compare the input value against a range to determine if the input is in range.
	**Middle Signal Select (LSMID)** Selects between multiple analog signals. This block selects the mid-valued input from those inputs that are not bad. When there is an even number of inputs in the selection process, the average of the 2 mid-valued inputs is used as the middle value
	**Boolean Fan Input (LSBFI)** Decodes a binary weighted input to individual bits and generates a discrete output value for each bit.
	**Boolean Fan Output (LSBFO)** Decodes a binary weighted input to individual bits and generates a discrete output value for each bit.
	**Bi-directional Edge Trigger (LSBDE)** Generates a True (1) discrete pulse output when the discrete input makes a positive (False-to-True) or a negative (True-to-False) transition since the last execution of the block. If there has been no transition, the discrete output is False (0).

Icon	Function Block Description
	**Positive Direction Edge Trigger (LSPDE)** Generates a True (1) discrete pulse output when the discrete input makes a positive (False-to-True) transition since the last execution of the block. If there has been no transition, the discrete output is False (0).
	**Negative Direction Edge Trigger (LSNDE)** Generates a True (1) discrete pulse output when the discrete input makes a negative (True-to-False) transition since the last execution of the block. If there has been no transition, the discrete output is False (0).
	**Reset/Set Flip-flop (LSRS)** Generates a discrete output value based on NOR logic of reset and set inputs. If the reset input is False (0) and the set input is True (1), the output is True. The output remains True regardless of the set value until the reset value is True. When reset becomes True, the output is False. When both inputs are True, the output is False. When both inputs become False, the output remains at its last state and can be either True orFalse.
	**Set/Reset Flip-flop (LSSR)** Generates a discrete output value based on NAND logic of set and reset inputs. When there set input is False (0) and the set input is True (1), the output is True. The output remains True until there set input isTrue and the set input is False.When the reset input isTrue,the output is equal to the set input. When both inputs are True, the output is True. When both inputs become False, the output remains at its last state and can be either True or False.
	**Logical And (LSAND), Not And (LSNAND)** AND—Generates a discrete output value based on the logical AND of two to sixteen discrete inputs. NAND—Generates a discrete output value based on inverting the logical AND of two to sixteen discrete inputs.
	**Logical Or (LSOR), Not OR (LSNOR)** OR–Generates a discrete output value based on the logical OR of two to sixteen discrete inputs.When one or more of the inputs is True (1), the output is set to True. NOR—Generates a discrete output value based on inverting the logical OR of two to sixteen discrete inputs. When one or more of the inputs is True (1), the output is set toFalse.
	**Not (LSNOT)** Inverts a discrete input signal. Supports signal status propagation.
	**Logical Not Exclusive Or (LSXNOR), Exclusive OR (LSOR)** XOR—Performs an exclusive OR of two inputs to produce a discrete output. XNOR—Inverts the result of an exclusive OR of twoinputs.
	**Off Delay Timer (LSOFFD)** Delays the transfer of a False (0) discrete input value to the output by a specified time period.

	**On-Delay Timer (LSOND)** Delays the transfer of a True (1) discrete input value to the output by a specified time period.
	**Retentive Timer (LSRET)** Generates a True (1) discrete output after the input has been True for a specified time period. The elapsed time the input has been True and the output value are reset when the reset input isset True.
	**Timed Pulse (LSTP)** Generates a True (1) discrete output for a specified time duration when the input makes a positive (False-to-True) transition. The output remains True even when the input returns to its initial discrete value and returns to its original False value only when the output is True longer than the specified time duration. Any 0 to True transition causes the timer to reset.
	**Calculation/Logic (LSCALC)** Evaluates a structured text expression.

Ordering Information

Description	Model Number
ProfessionalPLUS Station	VE2101S xxxxx*
Configuration Software Suite	VE2162
DeltaV SIS Configuration Software License	VS1508
Standalone DeltaV SIS Configuration Software License	VS1509**

**xxxxx = 00025 to 30000 DSTs -The license limits are enforced on a system-wide basis and not on a per logic solver basis.*

*** The VS1509, Standalone DeltaV SIS Configuration Software License, provides the same functionality as the VS1508. DeltaV SIS Configuration Software License. Use the VS1509 license when the DeltaV SIS system is connected to a non-DeltaV host DCS, or is otherwise not part of a larger DeltaV system.*

Related Products

- **Configuration Audit Trail.** A powerful tool that tracks changes and manages revision information for any item in the DeltaV SIS configuration database.
- **Operator Display Products.** For increased visibility into your process, the Operator Interface enables high-resolution, real-time displays to easily be created using graphics, text, data and animation tools.
- **Control Studio Online.** Displays online values of safety loops while they are running.

Related Hardware Products

- **DeltaV SIS Smart Logic Solver 1508.** Smart Logic Solvers (SLS1508) contain the DeltaV SIS logic-solving capability and provide an interface to up to16 I/O channels that can be configured as Discrete Input, Discrete Output, Analog Input (HART) and HART two-state output channels. See the DeltaV SIS Logic Solver product data sheet for more information.
- **DeltaV SIS CHARMs Smart Logic Solver.** CHARMs Smart Logic Solvers (CSLS) contain the DeltaV SIS logi-solving capabilities and provide an interface to up to 96 individually configurable channels, allowing flexibility for implementing safety instrumented functions and is designed specifically for multi-core home run cables or field junction box installation

Prerequisites

- DeltaV SIS v8.3 software or later for SLS1508.
- DeltaV SIS v12.3 software or later for CSLS.

Emerson
North America, Latin America:
+1 800 833 8314 or
+1 512 832 3774

Asia Pacific:
+65 6777 8211

Europe, Middle East:
+41 41 768 6111

www.emerson.com/deltavsis

DELTAV™

EMERSON™

DeltaV SIS™ Logic Solver

- World's first smart SIS Logic Solver
- Flexible deployment
- Easy compliance with IEC 61511
- Scales to fit any size application
- SIL 3-rated
- Cybersecurity readiness

The DeltaV SIS™ platform is the world's first smart process safety system to use the power of predictive intelligence for increasing the availability of the entire safety instrumented function.

Introduction

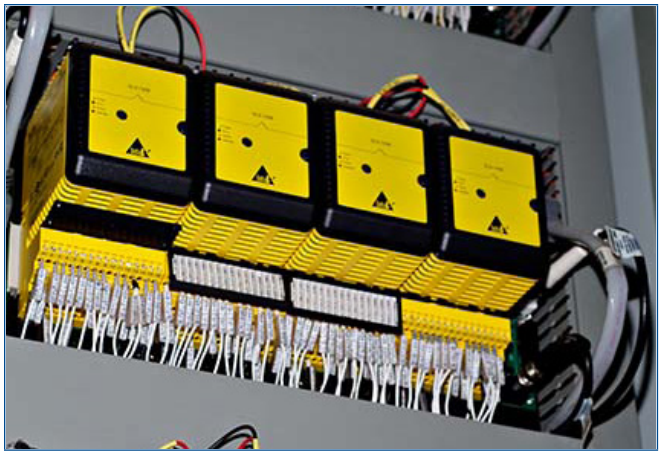
The DeltaV SIS™ process safety system, part of Emerson's smart SIS, ushers in the next generation of Safety Instrumented Systems (SIS). This smart SIS approach uses the power of predictive field intelligence to increase the availability of the entire safety instrumented function.

Benefits

The World's first smart SIS. Research shows that over 85% of all faults in SIS applications occur in field instruments and final control elements. The DeltaV SIS process safety system has the first smart logic solver. It communicates with intelligent field devices using the HART protocol to diagnose faults before they cause spurious trips. This approach increases process availability and reduces lifecycle costs.

Flexible deployment. Traditionally, process safety systems have been deployed either separate from the control system or interfaced to control systems via engineered interfaces based on open protocols (e.g. Modbus). However, most end users require a higher integration for configuration, maintenance, and operations environment. DeltaV SIS can be deployed either as interfaced to any DCS or integrated with DeltaV DCS. Integration is accomplished without scarifying functional separation as safety functions are implemented in separate hardware, software, and networks while being seamlessly integrated at the workstations.

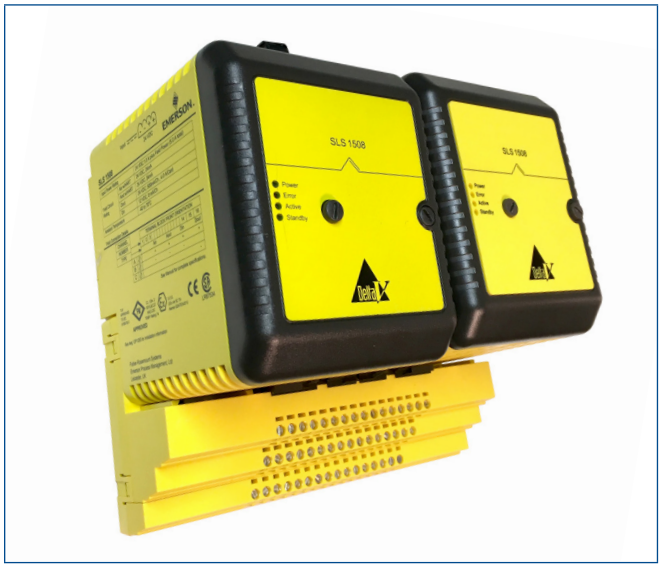
Easy Compliance with IEC 61511. IEC 61511 demands rigorous user management and the DeltaV SIS process safety system provides it. IEC 61511 requires that any changes made from an HMI (e.g. to a trip limit) be extensively vetted to ensure that the right data is written to the right Logic Solver. The DeltaV SIS process safety system automatically provides this data verification.



The DeltaV SIS process safety system scales to fit your safety application.

Scales to fit any size application. Whether you have an isolated wellhead or a large ESD/fire and gas application, the DeltaV SIS process safety system scales to provide you with the safety coverage you need for your SIL 1, 2 and 3 safety functions. Each SLS 1508 Logic Solver has dual CPUs and sixteen channels of I/O built into it. This means that no additional processors will ever be required to expand the system, since each Logic Solver contains its own CPUs. Scan rate and memory usage are constant and independent of system size.

SIL 3-rated. DeltaV SLS 1508 Logic Solvers are installed in redundant pairs for increased process availability of your SIS loops.



A redundant SLS 1508 Logic Solver.

Redundant architecture includes:

- Dedicated redundancy link
- Separate power supply to each Logic Solver
- I/O published locally every scan on redundant peer-to-peer link
- Same input data for each Logic Solver

Cybersecurity readiness. In an increasingly connected world, cybersecurity rapidly became an integral part of every process safety project. Building a defendable architecture is the basis for achieving a defendable safety system. DeltaV SIS when deployed with DeltaV DCS was the first process safety system to be certified according to ISA System Security Assurance (SSA) Level 1, based on IEC 62443.

Product Description

This section provides general information on DeltaV SIS hardware. Refer to the *Installing Your DeltaV Distributed Control System* manual for more information on DeltaV system hardware.

DeltaV SIS Hardware

The DeltaV SIS process safety system consists of the following hardware:

- Redundant Logic Solvers (SLS 1508) and termination blocks
- SISNet Repeaters (see separate **product data sheet**)
- Carrier extender cables
- Local peer bus extender cables
- Right 1-wide carrier with termination

Logic Solvers (SLS 1508) contain the logic-solving capability and provide an interface to 16 I/O channels that can be configured as Discrete Input, Discrete Output, Analog Input (HART) and HART two-state output channels. Logic Solvers and termination blocks install on the 8-wide carrier. Logic Solvers communicate with each other through the carriers over a two-channel, local peer bus (SISnet) and remote peer ring. Local Logic Solvers are hosted by the same DeltaV controller and remote Logic Solvers are hosted by a different DeltaV controller. Logic Solvers are powered by a 24 V DC power supply that is separate from the power supply that drives the DeltaV controller and I/O. Logic Solvers install in odd-numbered slots (1,3,5,7) on the 8-wide carrier. Redundant Logic Solvers use four slots.

SISNet Repeaters extend communication beyond the local Logic Solvers connected to one DeltaV controller and broadcast global messages to remote SLS 1508 Logic Solvers through a fiber-optic ring Carrier extender cables extend Local Bus power and signals between 8-wide carriers. Local peer bus extender cables extend the local peer bus (SISNet) between SLS 1508 Logic Solvers on different carriers. 1-wide carriers with terminators terminate the local peer bus at the final carrier. For additional information please consult DeltaV SISNet Repeater product datasheet.

Communication

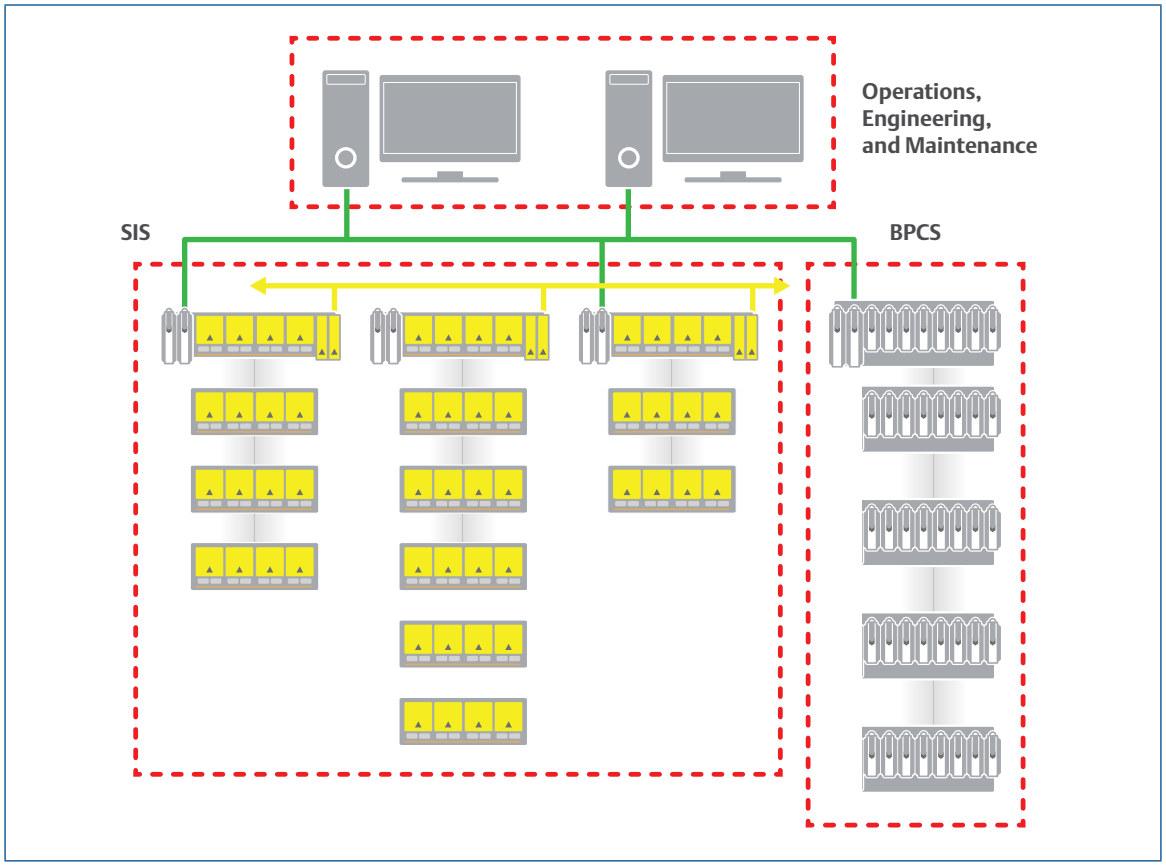
Control Network: The DeltaV Control Network provides communication between the nodes in the DeltaV network. Refer to the Installing Your DeltaV Digital Automation System manual for complete information on the Control Network.

Local Bus: The Local Bus provides communication between DeltaV controllers and SLS 1508 Logic Solvers and between DeltaV controllers and SISnet Repeaters.

Local Peer Bus (SISNet): SLS 1508 Logic Solvers communicate with other SLS 1508 Logic Solvers and with local SISNet Repeaters through the carriers over a 2 channel local peer bus. The same message is broadcasted over both channels. The local peer bus must be terminated at both ends. The local peer bus is terminated at the left end through the 2-wide power/controller carrier and at the right end through a terminated 1-wide carrier.

The SISNet Repeaters can be located anywhere on a local peer bus – between the DeltaV Controller(s) and the terminated 1-wide carrier.

Remote Peer Ring: SISNet Repeaters hosted by one DeltaV controller communicate with SISNet Repeaters hosted by a different DeltaV controller over a fiber-optic remote peer ring. A local SISNet Repeater collects locally generated messages that have been designated as global variables into a single message and sends it to the next SISNet Repeater in the ring. Upon receipt of a message, the receiving SISNet Repeater broadcasts it on its local peer bus (SISNet) and forwards the message to the next SISNet Repeater in the ring. A global message is forwarded around the ring once. The primary SISNet Repeaters form one fiber-optic ring and the secondary form a separate, independent ring.



DeltaV SIS process safety system architecture.

Carrier extender cables and local peer bus extender cables connecting a DeltaV controller and 8-wide carrier with standard DeltaV I/O and SLS 1508 Logic Solver to a second 8-wide carrier (hosted by the same controller) are installed with SLS 1508 Logic Solvers, SISNet Repeaters, and a terminated 1-wide carrier. SLS 1508 Logic Solver messages are communicated to a remote SLS 1508 Logic Solver (hosted by a separate controller) through fiber-optic cables.

Multiple Domains: The simplest implementation of an SLS 1508 network is to have one SIS Network ring and one SIS Network domain, that includes all of the logic solvers in the SIS Network ring. In larger applications, the logic solvers can be split into multiple SIS Network domains. Another approach is to have multiple SIS Network rings, each on a SIS Network domain.

Unique Redundancy Methodology

Introduction to Redundancy

While the SLS 1508 Logic Solver is rated suitable for use in SIL 3 applications in simplex mode, it is installed in redundant pairs for increased process availability.

Redundant SLS 1508 Logic Solvers run in parallel at all times. Both read the inputs from the I/O terminals, both execute the logic and both drive the outputs at the I/O terminals. There is no concept of primary and backup or master and slave, which is unlike any other SIS. The only difference between the two is that one communicates with both the engineering and operator workstations and the dedicated safety network (SISNet); this is the one with the Active light on the bezel. The other (Standby) is communicating only on the SISNet.

In the event that a failure is detected in one of the SLS 1508 Logic Solvers, it automatically goes to a failed state. In this condition, all its output channels are de-energized; this has no impact on the other SLS 1508 Logic Solver or the physical outputs because the other SLS 1508 Logic Solver continues to read inputs, execute logic and drive outputs. The transition from redundant to simplex mode is therefore completely bumpless.

Redundancy

The redundant SLS 1508 Logic Solver modules are connected to the field at the redundant terminal block. No control strategy configuration is required to take advantage of SLS 1508 Logic Solver redundancy, as the system's auto-sense capability automatically recognizes the redundant pair of Logic Solvers.

An integrity error alarm in a redundant SLS 1508 Logic Solver pair will notify the operator of a failure. Both SLS 1508 Logic Solvers in a redundant pair are monitored for integrity alarms at all times.

Events that can cause integrity alarms include:

- Hardware failure within a SLS 1508 Logic Solver
- Communications failure between a SLS 1508 Logic Solver and the SISNet
- Communications failure between a redundant pair of SLS 1508 Logic Solvers
- Communications failure between a SLS 1508 Logic Solver and an DeltaV Controller
- Removal of a SLS 1508 Logic Solver from the carrier

The health and status of both SLS 1508 Logic Solvers and their channels are available in the diagnostics explorer.

When one of a redundant pair of SLS 1508 Logic Solvers is removed online there is no disturbance to the process. When the missing SLS 1508 Logic Solver is replaced with another SLS 1508 Logic Solver, the new SLS 1508 Logic Solver completes its power-up self-tests before the active Logic Solver cross-loads the current database. In safe areas, failed SLS 1508 Logic Solvers can be replaced under power. In hazardous areas, appropriate installation procedures must be followed.

Automatic proof testing can be selected on a redundant pair of SLS 1508 Logic Solvers. The desired proof-test interval is set in the configuration and the SLS 1508 Logic Solvers perform the proof test automatically. A warning is given to the operator before the automatic proof test is started.

Sequence of Events Capability

With DeltaV SIS process safety system, events are automatically generated as function blocks are executed within a module scan. Events are time stamped with a resolution of <1 ms, and they are recorded in the sequence that they occur in the Event Chronicle. When using standard function blocks such as input blocks, |voter blocks, and cause and effect blocks, a standard set of events are automatically generated without special configuration or programing required. For example, I/O failures, trip limits, first outs, and other similar events are automatically time stamped by function blocks and recorded in the Event Chronicle. When a process variable exceeds the trip limit, DeltaV SIS records the event along with the analog value and the trip condition.

In general, when there is a plant event that triggers an emergency shutdown from the SIS, one input will exceed a trip limit on one scan and this will cause outputs to trip and more inputs will then change state. Sequence of Events Recording has been used to find that first input that caused the trip by looking at all of the inputs in the plant. With the DeltaV SIS system, the operator simply filters the Event Chronicle for first out trips, and the first-out is clearly visible.

If higher resolution is required for some channels then they can be wired to both the DeltaV SIS Logic Solver and also to a DeltaV Discrete Input Card for Sequence of Events, which provides a resolution of 0.25 ms.

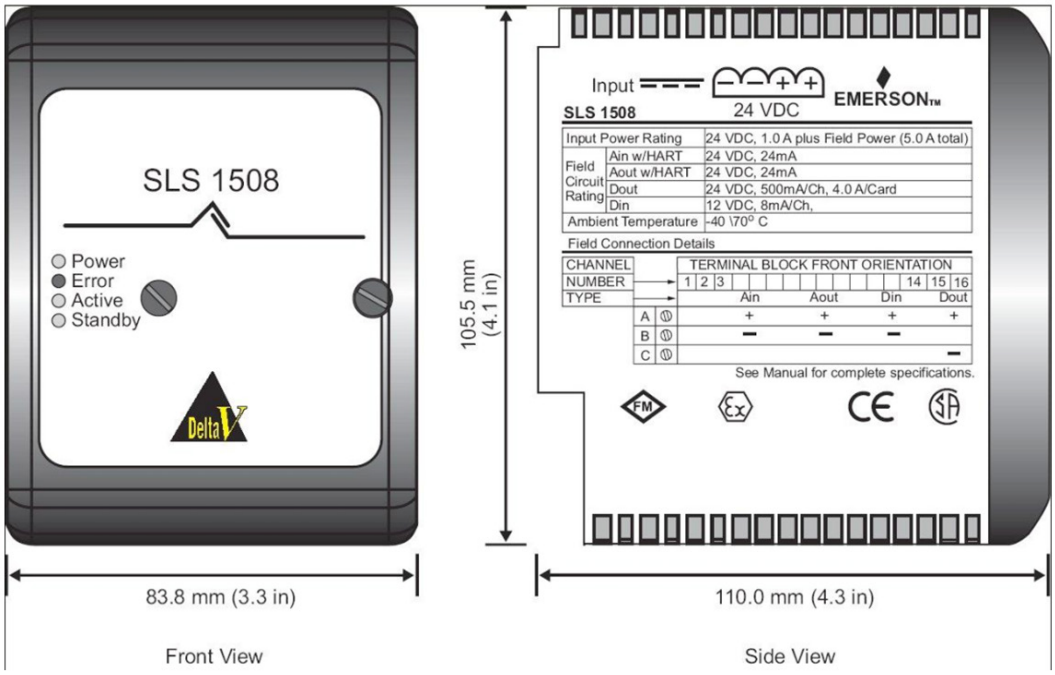
System Compatibility

DeltaV SLS 1508 Specifications

Common Environmental Specifications for SLS 1508 Logic Solver	
Category	**Specifications**
Storage Temperature	-40 to 85°C (-40° to 185°F)
Operating Temperature*	-40 to 70°C (-40° to 158°F)
Relative Humidity	5 to 95% , non-condensing
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Protection Rating	IP 20
Hazardous Area/Location	European EMC Directive per EN61326-1, Criterion A NAMUR NE21 EMC Requirements Low Voltage Directive IEC 61010-1 Factory Mutual, Non-Arcing Class 1, Div 2, Groups A, B, C, D, T4 hazardous locations ATEX 3 G EEx IIC-nA T4 EN50021:1999 CSA 1010
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150 Hz

Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper for more information.*

SLS 1508 Logic Solver Physical Specifications	
Item	**Specifications**
Input Power	24 V DC ± 20%, 1.0 A plus field power (5.0 A total)
	Note: It is recommended that the SLS and DeltaV controller and I/O use separate power supplies
Field Power	4 A maximum (actual value depends upon channel type and field device type)
Isolation	Each channel is optically isolated from the system and factory-tested to 1500 V DC. No channel-to-channel isolation.
Local Bus Current	None
Mounting	In SIS (yellow) terminal blocks in odd-numbered slots (1, 3, 5, 7) on the 8-wide carrier. Redundant SLSs take 4 slots.



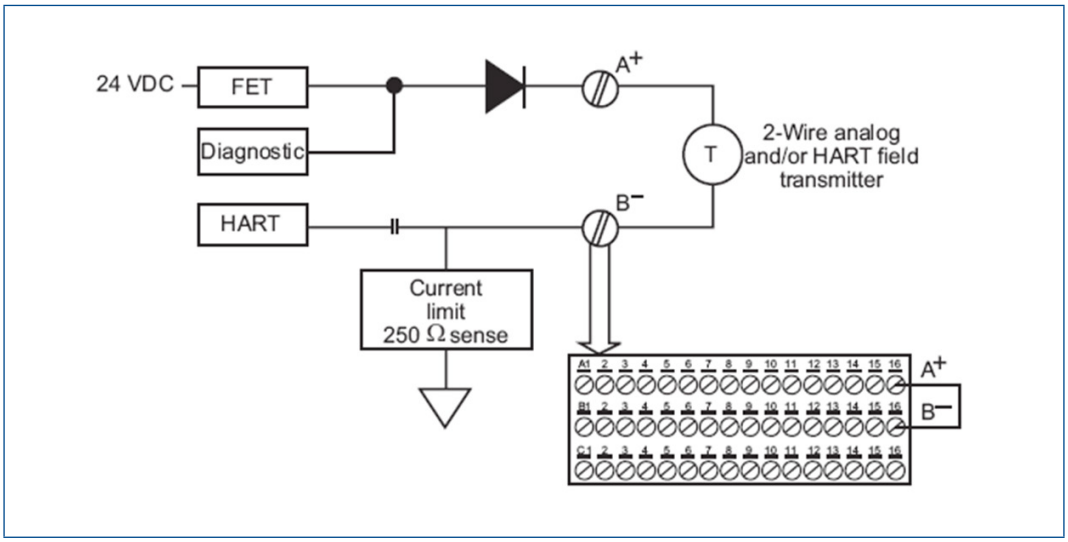
Logic Solver dimensions.

SLS 1508 Logic Solver Weight, Heat Generation and Power Consumption	
Item	**Specifications**
Redundant Logic Solver	Weight – 1.20 kg Heat Dissipation – 24 W Power – 2 A @ 24 V DC + Dig out Field Loads

Channel Specifications

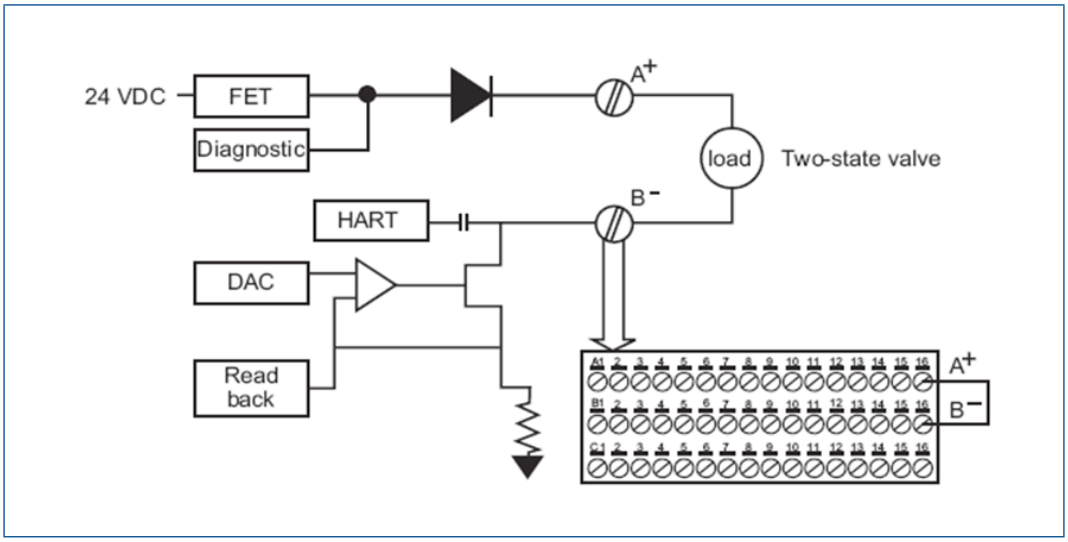
The Logic Solver provides 16 channels of flexible I/O, meaning that each channel can be configured as an Analog Input (HART), HART Two-State Output, Discrete Input, or Discrete Output channel.

Analog Input Channel Specifications (Includes Hart)	
Item	**Specifications**
Number of Channels	16
Isolation	Each channel is optically isolated from the system and factory-tested to 1500 V DC. No channel-to-channel isolation.
Nominal Signal Span	4 to 20 mA
Full Signal Range	1 to 24 mA
2-Wire Transmitter Power	15.0 V minimum terminal-to-terminal @ 20 mA; current limited to 24 mA max
Input measurement accuracy	0.2% of span
Safety / Diagnostic Accuracy	2.0% of span
Resolution	16 bits
Filtering	2-pole, corner frequency 5.68 Hz -3 dB at 5.68 Hz -20.0 dB at 40 Hz (half the sample rate)



Wiring diagram and terminations for HART analog input channels.

Hart Two-State Output Channel Specifications	
Item	**Specifications**
Number of Channels	16
Isolation	Each channel is optically isolated from the system and factory-tested to 1500 V DC. No channel-to-channel isolation.
Nominal Signal Span	On state 20 mA Off state 0 or 4 mA (configurable)
Full Signal Range	0 to 24 mA
Safety / Diagnostic Accuracy	5.0% of span
Resolution	12 bits
Compliance Voltage	20 mA into 600 Ω load
Open-Loop Detection	< 1.0 mA – when the output drifts 15% out of the configured value



Wiring diagram and terminations for 2-Wire HART two-state output channels.

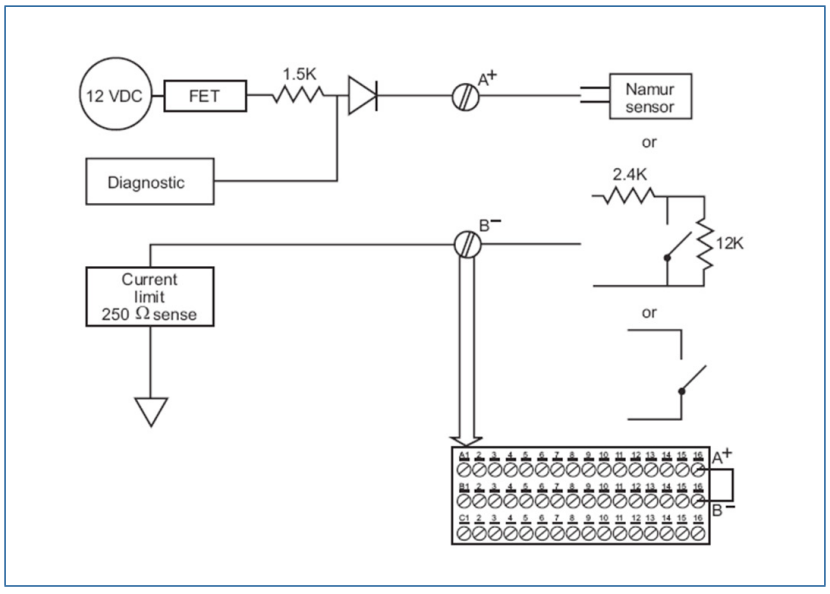
Discrete Input Channel Specifications	
Item	**Specifications**
Number of Channels	16
Isolation	Each channel is optically isolated from the system and factory-tested to 1500 V DC. No channel-to-channel isolation.
Detection Level For On	≥2 mA
Detection Level For Off	≤1.65 mA
Input Impedance	~1790 Ω
Input Compatibility	Inputs compatible with: ■ NAMUR sensors (12 V) ■ Dry contact ■ Dry contact with end-of-line resistance
Line Fault Detection – Short Circuit (Optional)	100 Ω > 6 mA
Line Fault Detection – Open Circuit (Optional)	> 40 kΩ < 0.35 mA

Line Fault Detection — The Discrete Input channels have line fault detection for detecting open or short circuits in field wiring. To use this capability you must:

Enable line fault detection in your configuration. Enable line fault detection on a channel-by-channel basis when you configure the channels.

Connect the dry contact to external resistors. Connect the dry contact to a 12 KΩ resistor in parallel (allows the open circuit detection) and a 2.4 KΩ resistor in series (allows short circuit detection).

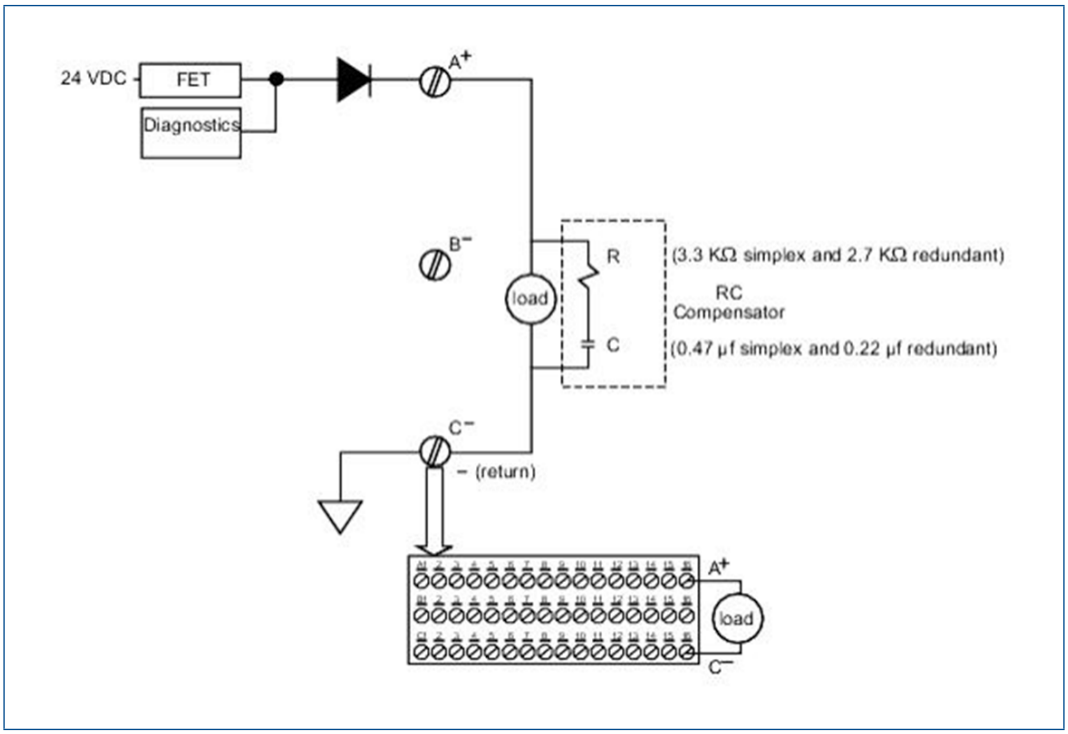
Line Fault Detection in NAMUR Sensors — Line fault detection is built into NAMUR sensors. Do not use external resistors with NAMUR sensors; however, you must enable line fault detection in your configuration when using NAMUR sensors.



Wiring diagram and terminations for discrete input channels.

Discrete Output Channel Specifications	
Item	**Specifications**
Number of Channels	16
Isolation	Each channel is optically isolated from the system and factory-tested to 1500 V DC. No channel-to-channel isolation.
Output Voltage	Field power minus 2 V
Field Power	0.5 A continuous per channel; 4.0 A max. per card
Output Loading	56 to 3500 Ω
Off-State Leakage	Open loop test on: 7.8 mA Open loop test off: 4.5 µA typical; 10 µA max. Note: Optional pulse test will apply 24 V DC pulse on line for 1.0 mS every 50 mS. Refer to the Installation Notes for more information on pulse testing.
Short Circuit Protection	Outputs current limited to 2.0 A typical
Line Fault Detection – Short Circuit	<5 Ω for >1 second with +24 V DC field power. Refer to the Installation Notes for information on pulse testing.
Line Fault Detection – Open Circuit (With +24 V Dc Field Power)	>25 kΩ for open loop detection <3.5 kΩ for no open loop detection Refer to the Installation Notes for information on pulse testing.

Pulse testing is recommended; however, it can be disabled for field devices such as solid state relays that cannot support it.



Wiring diagram and terminations for discrete output channels.

Ordering Information

Description	Model Number
DeltaV SLS 1508 Redundant Logic Solver – includes Terminal Block	VS3202
1-wide SIS Net Terminator Assembly (right-hand extender card and two termination resistors)	VS6051
Database Extension for SIS	VS1508
8-Wide Carrier with Extend Cable Assembly (Cable Assembly consists of left & right extender cards, 2 coax cables for Logic Solver communications bus and one cable for carrier backplane communications)	VE4050E1C2
2-Wide Carrier (New modified 2-wide carrier containing bus terminations)	VE3051C0

Related Products

- **DeltaV Workstations and Server Hardware**
- **DeltaV M-Series Traditional I/O**
- **DeltaV SIS Hardware Carriers**
- **DeltaV M-Series I/O Subsystem Horizontal Carriers**
- **DeltaV VerticalPlus I/O Subsystem Carrier**
- **DeltaV PK Controller**
- **DeltaV SIS with Electronic Marshalling**

Prerequisites

- DeltaV v8.3 software or later.
- The 2-wide power/controller carriers were upgraded in 2004 to accommodate the DeltaV SIS system. The new version of the 2-wide power/controller carrier has a small white rectangle printed on the board. This is visible between the power supply module and the MD Controller. The new part number is KJ4001X1-BA3 or higher. The old version had a white dot in place of the rectangle. The old version (with white dot) will not support downloads to a Logic Solver.
- The earliest MD Controllers will not support the DeltaV SIS system. The MD controllers must have a part number 12P2093X082 or higher.

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DeltaV SISnet Fiber Components

DeltaV SIS is the world's smart SIS system to use the power of predictive intelligence for increasing the availability of the entire safety instrumented function.

- Fiber-optic repeater for redundant safety-rated communications
- Dedicated to safety—no possibility of common-cause control and safety communications failures
- 50 mS update time anywhere on the SISnet
- Spans 32 nodes

Introduction

The DeltaV SIS™ system, part of Emerson's smart SIS, ushers in the next generation of Safety Instrumented Systems (SIS). This smart SIS approach uses the power of predictive field intelligence to increase the availability of the entire safety instrumented function.

DeltaV SISNet Fiber Components

Benefits

Fiber-optic repeater for redundant safety-rated communications. The SISnet Repeater is used when safety-critical inter-trip signals are needed across a physically spread-out plant.

Dedicated to safety. Some systems use the same networks for both control and safety. DeltaV SIS SISnet is dedicated to safety, carrying only safety-rated signals. It is therefore immune to any failure of the control network.

50 mS update time. All of the data broadcast on the SISnet is available to all of the other nodes within 50 mS. This, combined with the speed of the logic solver, guarantees input-to-output times of less than 225 mS anywhere on the distributed SISnet.

Spans 32 nodes. The SISnet spans 32 nodes in a redundant ring architecture. These nodes can be up to 2 km apart, so the whole ring can be up to 64 km around. If even longer distances are required, then the SISnet Extender can be used to achieve distances of greater than 60 km between nodes, going a total distance of 1920 km.

The 50 mS update time is guaranteed even at this size of network.

Product Description

This section provides general information on DeltaV SIS hardware. Refer to the *Installing Your DeltaV Digital Automation System* manual for more information on DeltaV system equipment.

DeltaV SIS Equipment

A DeltaV automation system consists of carriers, one or more I/O subsystems, controllers, power supplies, workstations, and a control network.

DeltaV SIS consists of:

- Logic Solvers (SLS 1508) and termination blocks (see separate product data sheet)
- SISnet Repeaters
- Carrier extender cables
- Local peer bus extender cables
- Right 1-wide carrier with termination
- SISnet Extenders as required

SISnet Repeaters extend communication beyond the local Logic Solvers connected to one DeltaV controller and broadcast global messages to remote Logic Solvers through a fiber-optic ring. Global messages refer to messages that are intended for all Logic Solvers. The SISnet Repeater installs on a 2-wide carrier. There is a primary and secondary SISnet Repeater on each carrier.

Carrier Extender Cables extend LocalBus power and signals between 8-wide carriers. *Local peer bus extender cables* extend the local peer bus (SISnet) between Logic Solvers on different carriers. *1-wide carriers* with terminators terminate the local peer bus at the final carrier.

SISnet Extenders extend the communications between SISnet Repeaters using single-mode fiber.

A redundant pair of SISnet Repeaters

Communication

Control Network: The DeltaV Control Network provides communication between the nodes in the DeltaV network. Refer to the *Installing Your DeltaV Digital Automation System* manual for complete information on the Control Network.

LocalBus: The LocalBus provides communication between DeltaV controllers and Logic Solvers and between DeltaV controllers and SISnet Repeaters.

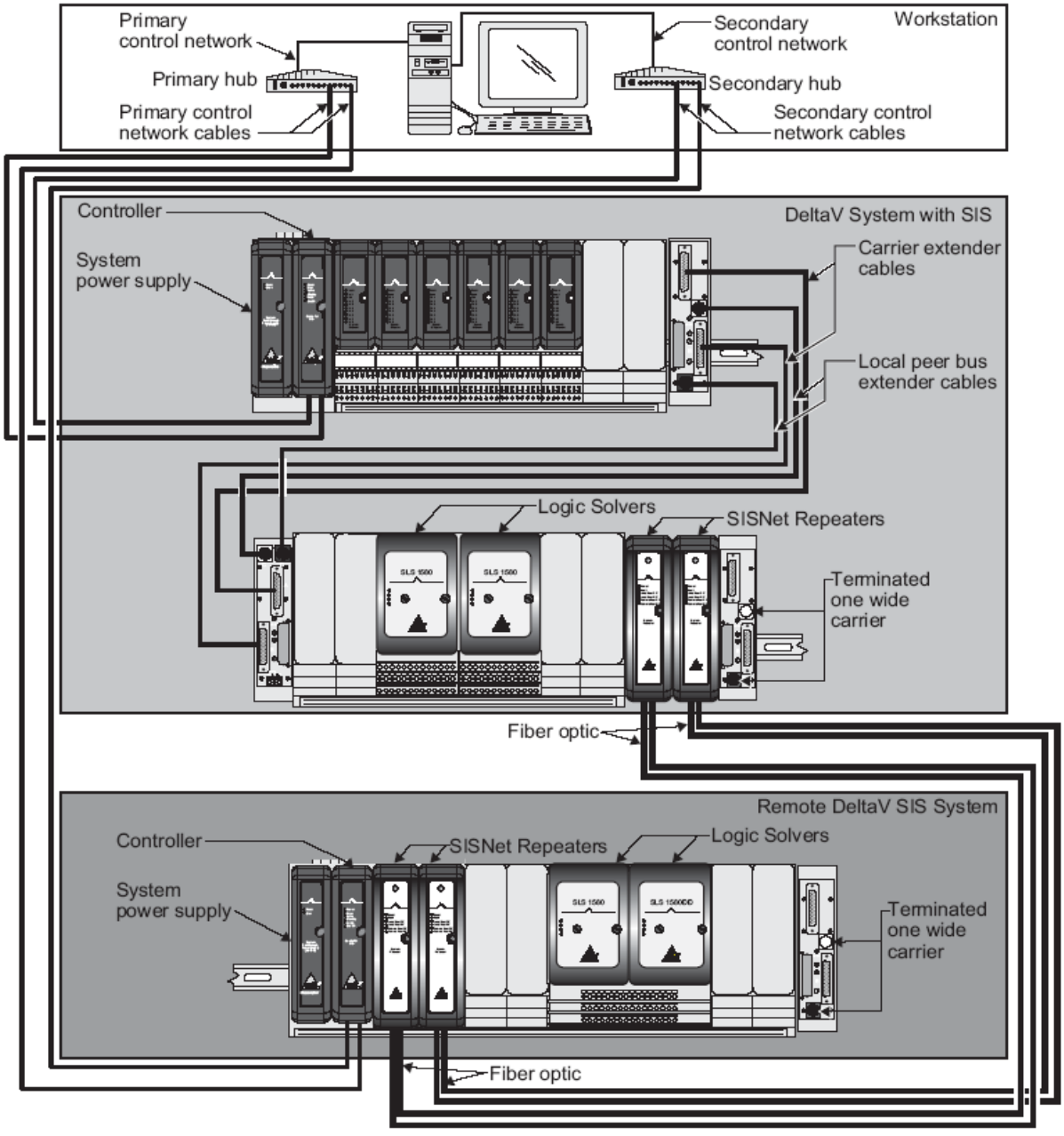
Local Peer Bus (SISnet): Logic Solvers communicate with other Logic Solvers and with local SISnet Repeaters through the carriers over a 2-channel local peer bus. The same message is broadcast over both channels. The local peer bus must be terminated at both ends. The local peer bus is terminated at the left end through the 2-wide power/controller carrier and at the right end through a terminated 1-wide carrier.

The SISnet Repeaters can be located anywhere on a local peer bus—between the MD Plus Controller(s) and the terminated 1-wide carrier.

DeltaV SISNet Fiber Components

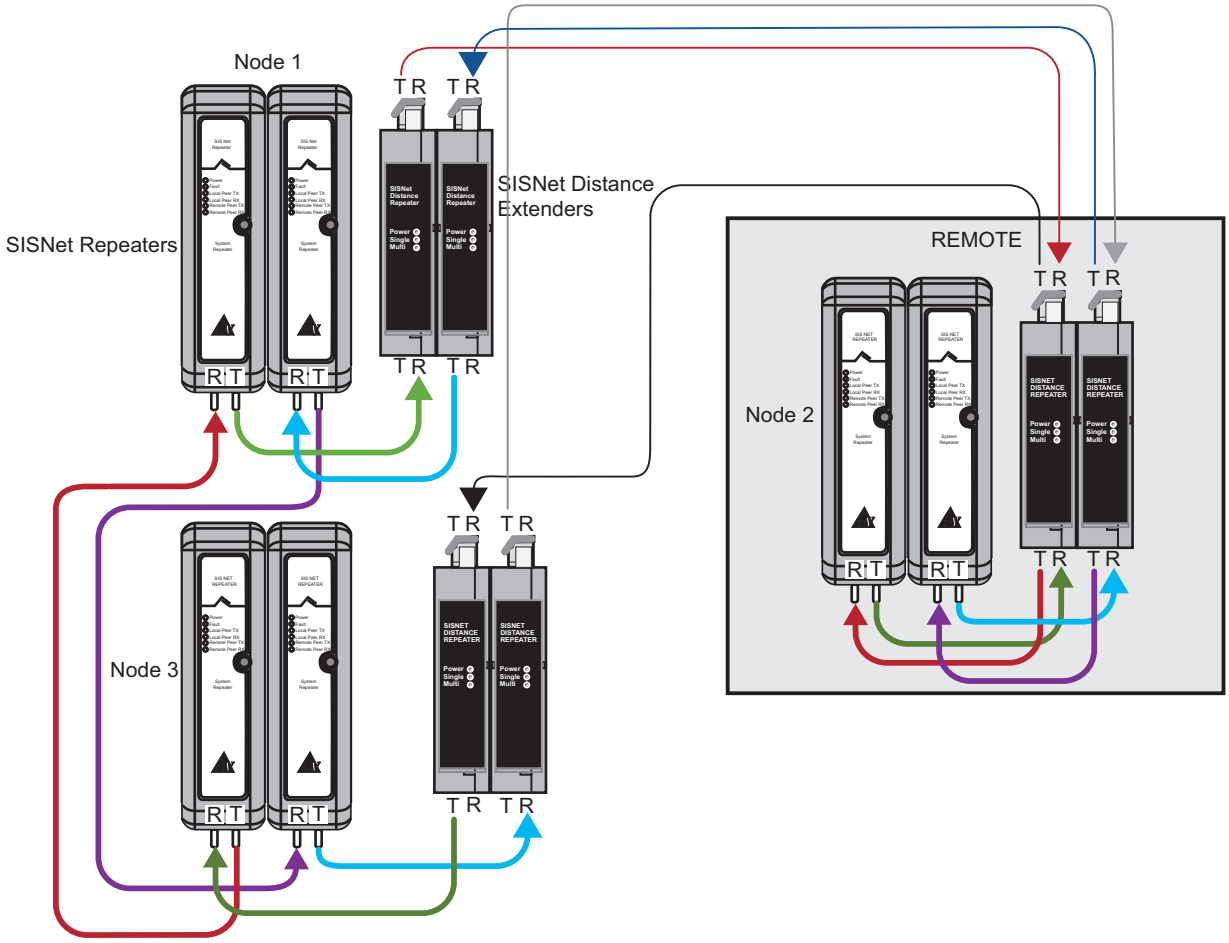
Remote Peer Ring: SISnet Repeaters hosted by one DeltaV controller communicate with SISnet Repeaters hosted by a different DeltaV controller over a fiber-optic remote peer ring. A local SISnet Repeater collects locally generated messages into a single message and sends it to the next SISnet Repeater in the ring. Upon receipt of a message, the receiving SISnet Repeater broadcasts it on its local peer bus (SISnet) and forwards the message to the next SISnet Repeater in the ring. A global message is forwarded around the ring once. The primary SISnet Repeaters form one fiber-optic ring and the secondary form a separate, independent ring. The fiber rings operate at 100 MB. By using the SISnet Extender, the ring can be a combination of multi-mode and single-mode fiber as required to achieve the inter-node distances.

Carrier extender cables and local peer bus extender cables connecting a DeltaV controller and 8-wide carrier with standard DeltaV I/O and DeltaV SIS to a second 8-wide carrier (hosted by the same controller) are installed with Logic Solvers, SISnet Repeaters, and a terminated 1-wide carrier. Logic Solver messages are communicated to a remote DeltaV SIS (hosted by a separate controller) through fiber-optic cable.



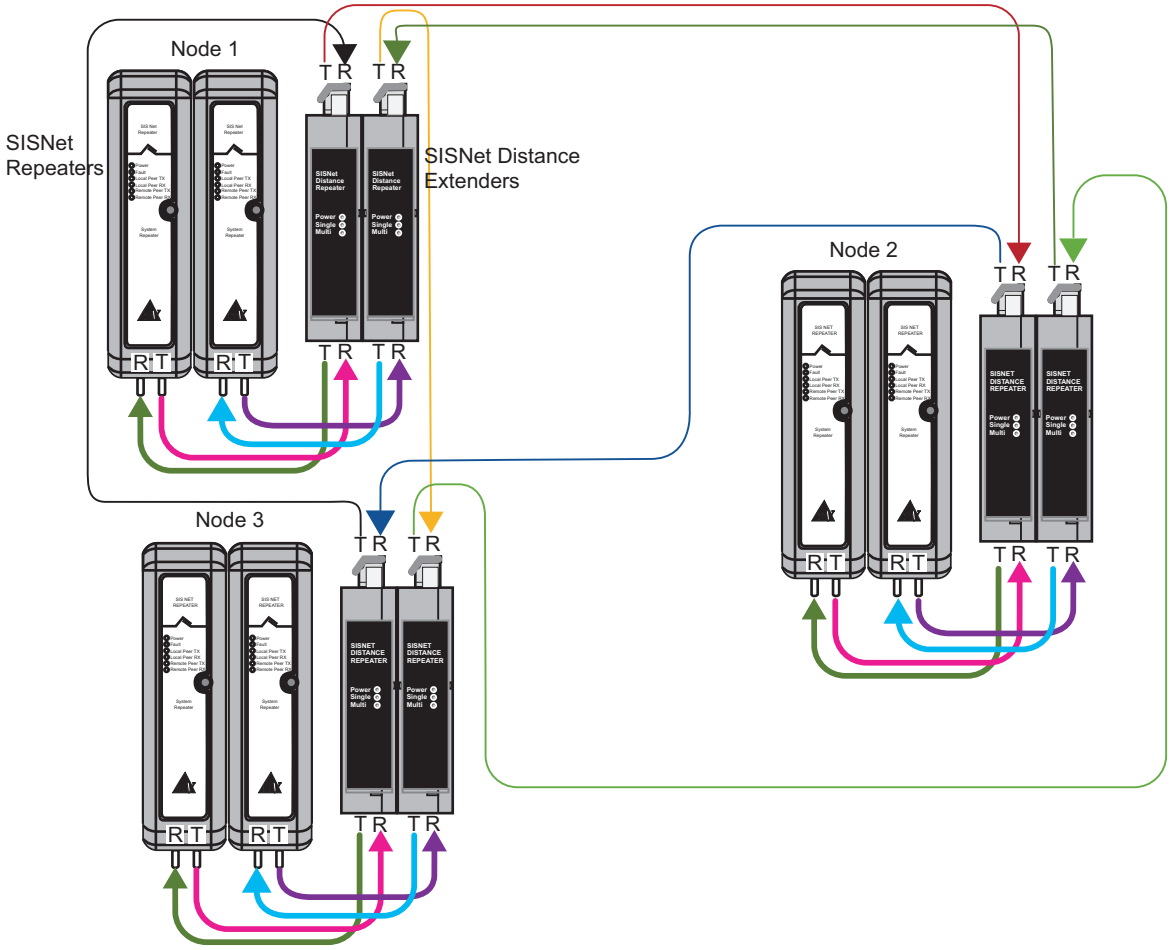
DeltaV SIS overview

The figure below shows a remote peer ring with two local nodes (Nodes 1 and 3) and one remote node (Node 2). Link distances for a local node are less than or equal to 2 km (nominal) one way. Link distances for a remote node are up to 60 km (nominal) one way.



Remote Peer Ring with Local and Remote Nodes

The figure below shows a remote peer ring in which all nodes are remote. This remote peer ring uses a counter-rotation topology in which the primary SISnet Repeaters are connected clockwise and the secondary counterclockwise.



Remote Peer Ring with all Remote Nodes

System Compatibility

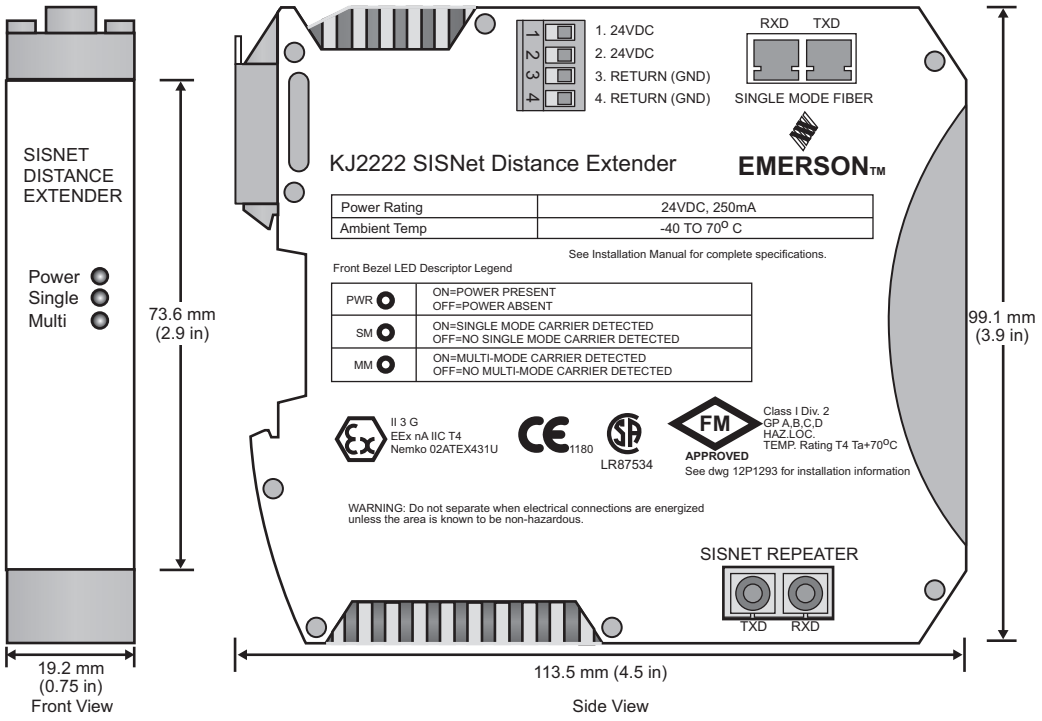
SISnet Distance Extender Specifications	
Item	**Specification**
Port types Multimode fiber port Single mode fiber port	 Duplex SC Duplex LC
Cable types Multimode Single mode	62.5/125 µm ST type or 50/125 µm ST type 9/125 µm .
Output power Multimode Single mode	14 dBm 0 dBm
Link budget Multimode Single mode	62.5/125 µm – max attenuation 11 dB 50/125 µm – max attenuation 8 dB Wavelength 1300 nm 9/125 µm – max attenuation 30 dB Wavelength 1310 nm
Link distance (nominal) Multimode Single mode	2 km one way TxD to RxD 60 km one way TxD to RxD **Note:** Actual lengths depend upon the quality of the fiber-optic cable and the connections.
Topology	Multimode (between SISnet Repeaters and SISnet Distance Extenders):SISnet Repeater RxD to SISnet Distance Extender TxD and SISnet Repeater TxD to SISnet Distance Extender RxD. Single mode (between SISnet Distance Extenders):RxD of successor SISnet Distance Extender to TxD of predecessor SISnet Distance Extender.
Mounting	DIN rail

Specifications for the SISnet Distance Extender

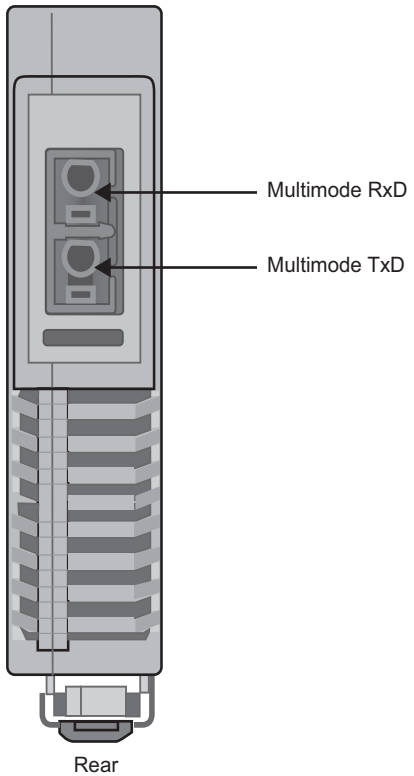
Common Environmental Specifications for SISnet Distance Extender	
Category	**Specifications:**
Storage temperature	-40 to 85 C (-40° to 185 °F)
Operating temperature	-40 to 70 C (-40° to 158° F)
Relative humidity	5 to 95% , non-condensing
Airborne contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Protection rating	IP 20, NEMA 12
Hazardous area/location	European EMC Directive per EN61326-1, Criterion A NAMUR NE21 EMC Requirements Low Voltage Directive IEC 61010-1 Factory Mutual, Non-Arcing Class 1, Div 2, Groups A, B, C, D, T4 hazardous locations ATEX 3 G EEx IIC-nA T4 EN60079-15 CSA 1010
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150 Hz

The table below shows the power specifications for the SISnet Distance Extender.

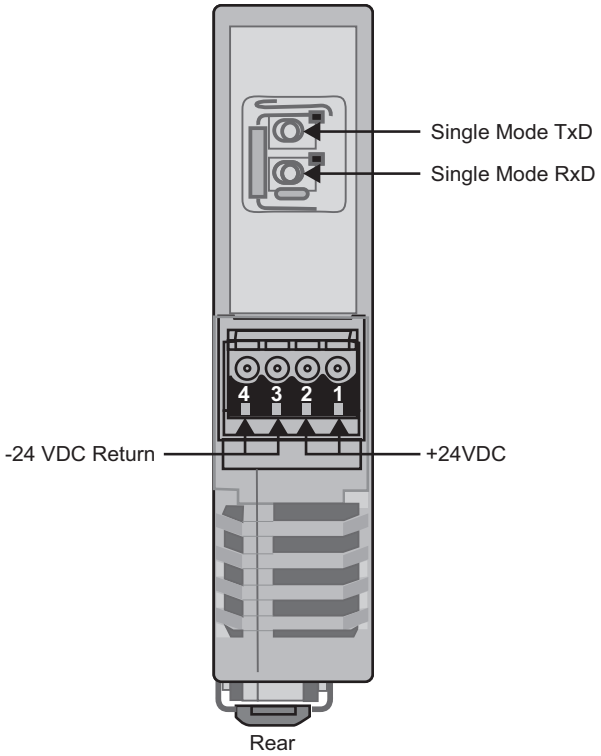
SISnet Distance Extender Power Specifications	
Item	**Specification**
Input power	19.2 VDC to 28.8 VDC @250 mA max
Connector type	4-position screw terminal
Wire type	Solid or stranded
Wire gauge	12 AWG maximum



SISnet Distance Extender Dimensions



Multi-mode fiber-optic connectors on the SISnet Distance Extender (bottom view)



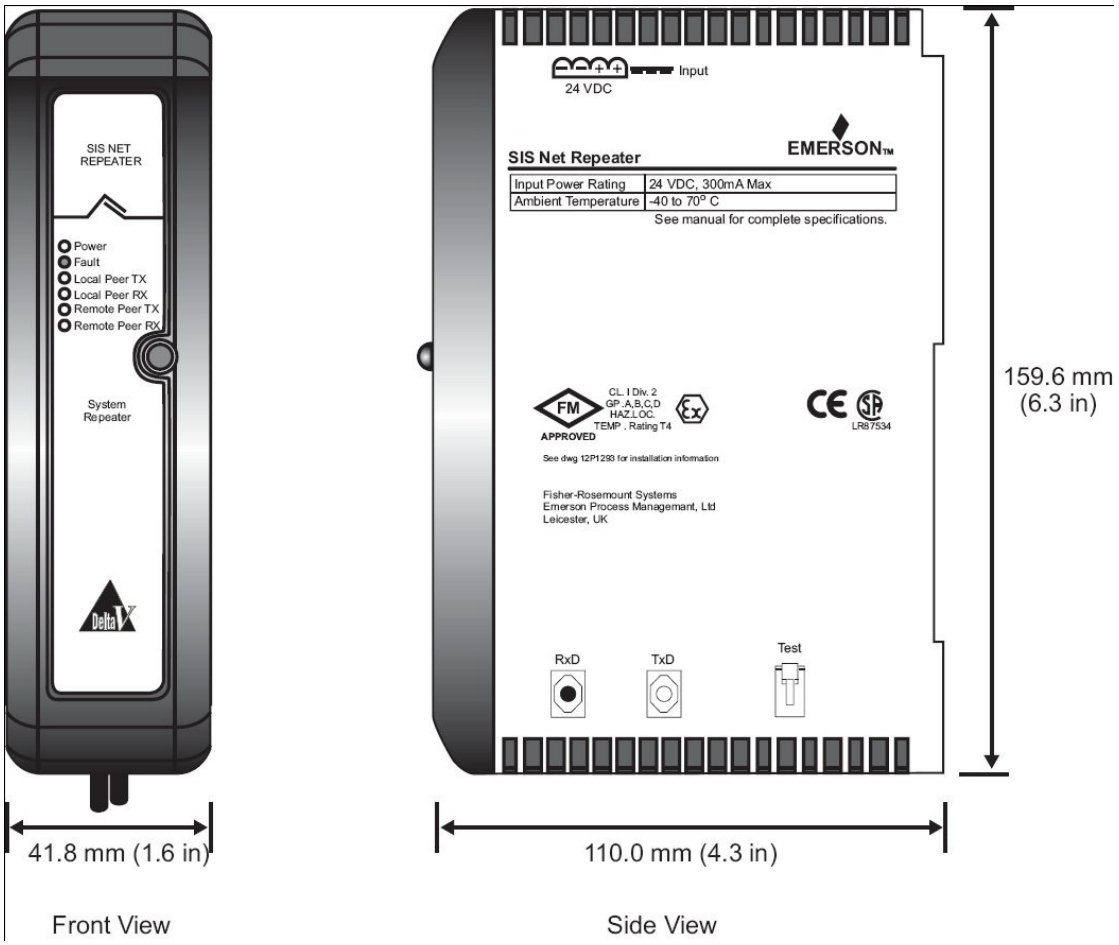
Single-mode fiber-optic connectors on the SISnet Distance Extender (top view)

SISnet Repeater Specifications

Common Environmental Specifications for SISnet Repeater	
Category	**Specifications:**
Storage temperature	-40 to 85 C (-40° to 185 °F)
Operating temperature	-40 to 70 C (-40° to 158° F)
Relative humidity	5 to 95% , non-condensing
Airborne contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Protection rating	IP 20, NEMA 12
Hazardous area/location	European EMC Directive per EN61326-1, Criterion A NAMUR NE21 EMC Requirements Low Voltage Directive IEC 61010-1 Factory Mutual, Non-Arcing Class 1, Div 2, Groups A, B, C, D, T4 hazardous locations ATEX 3 G EEx IIC-nA T4 EN50021:1999 CSA 1010
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150 Hz

SISnet Repeater Specifications	
Item	**Specifications:**
Port Type	ST Female
Cables Type	Multimode 62.5 / 125 µm; ST type or Multimode 50 / 125 µm; ST type
Output power	< -12 dB
Link budget	Multimode 62.5 / 125 µm – max attenuation 11 dB Multimode 50 / 125 µm – max attenuation 8 dB
Link distance (max)	2 km one way TxD to RxD
Topology	Physical ring: RxD connects to TxD of predecessor and TxD connects to RxD of successor
Test port type	For factory use only
Mounting	2-wide SISnet Repeater carrier Left carrier position is secondary SISnet Repeater; right carrier position is primary SISnet Repeater

SISnet Repeater Power Specifications	
Item	**Specifications:**
Input	24 V DC, 300 mA (max)
Connector type	4-position screw terminal
Wire type	Solid or Stranded
Wire gauge	12 AWG maximum



SISnet Repeater Dimensions

SISnet Repeater Weight, Heat Generation and Power Consumption	
Item	**Specifications:**
SISnet Repeater	Weight – 0.795 kg Heat Dissipation – 8 W Power – 0.3 A @ 24 V DC
1-wide SISnet Terminator Assen	Weight – 0.20 kg Heat – N/A Power – N/A

Ordering Information

Description	Model Number
Redundant SISnet Repeater (Two Repeater modules and a two-wide carrier)	CS6002
SISnet Terminator Assembly	CS6051
8-Wide Carrier with Extend Cable Assembly (Cable Assembly consists of left & right extender cards, 2 coax cables for Logic) (Solver communications bus and one cable for carrier backplane communications)	CE4050E1C2
1-wide SISnet Terminator Assembly (right-hand extender card and two termination resistors)	CS6051
Redundant SISnet Distance Extenders	CS6003

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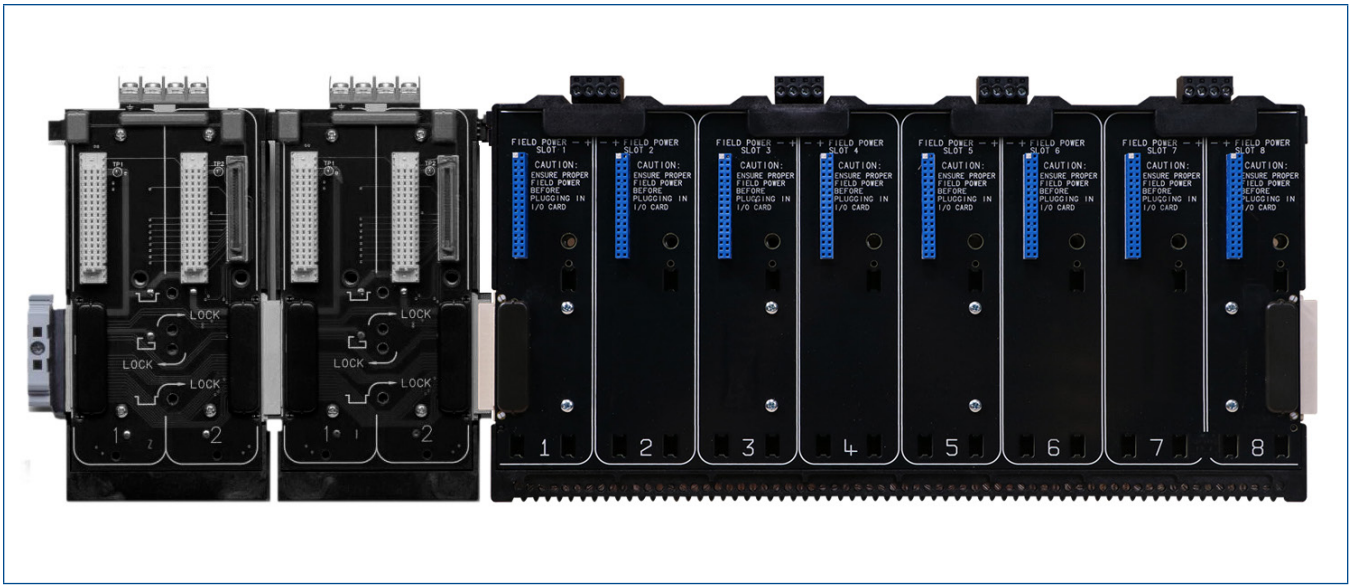
DeltaV™ M-series I/O Subsystem Horizontal Carriers



The DeltaV™ modular I/O subsystem is easy to install and maintain.

- Modular design allows flexible installation
- Allows you to expand online
- Integrated power distribution

Introduction

Get your I/O subsystem up and running efficiently with the DeltaV™ horizontal mount I/O carriers. The power/controller carrier contains internal power buses. You don't need to use external cabling to connect the system power supply to the DeltaV controller and the I/O interface carriers.

The power/controller and I/O carriers are modular. Purchase only what you need but be assured that as your system grows you can add plug-and-play carriers—Easy!

Benefits

Modular design allows flexible installation. A T- type DIN rail is all you need to mount the power/controller carrier into place. The I/O interface carrier plugs on to the power/controller carrier. Simply plug your I/O terminal blocks into the carrier. The DeltaV system's modular design approach allows you to add I/O carriers as you need them.

Allows you to expand online. Additional 8-wide carriers may be added online as desired. Carrier extenders give you the flexibility to install I/O carriers in multiple rows with 1,2, 3 or 4 carriers per row.

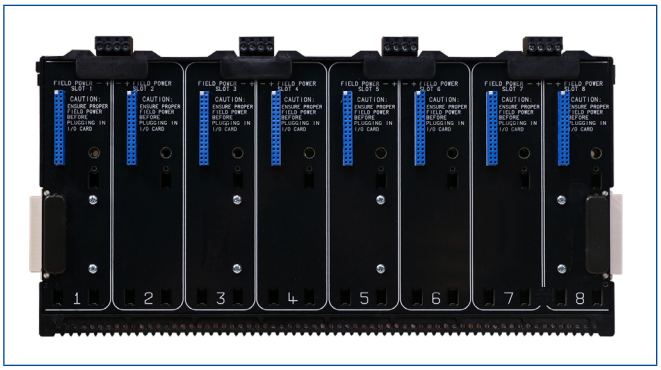
Integrated power distribution. Controller and I/O interface power distribution is integrated into the carriers to reduce and simplify power and grounding. Carriers also have integrated shield ground bar to isolate and drain field noise away from system power.

The DeltaV horizontal-mount carriers provide plug-and- play ease for your I/O subsystems.

Product Description

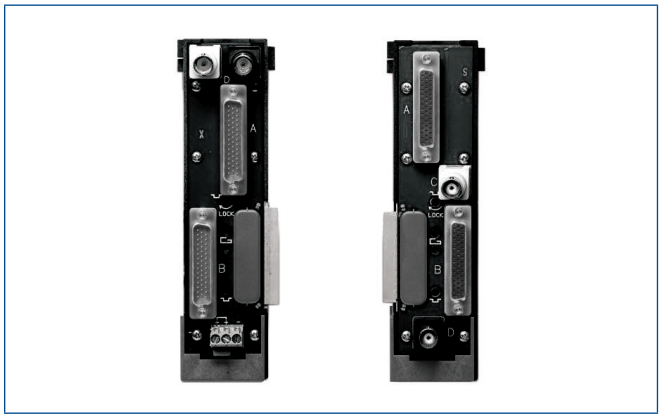
The I/O interface carrier plugs on to the power/controller carrier. The power/controller carrier supplies the system power and communications between the I/O interfaces and the controller. The controller processes the I/O interface information. An additional power/controller carrier is required for use with redundant controllers.

Mount your interface carrier on a T-type DIN rail. The I/O interface carrier includes the connections for the bulk 24 V DC field instrument power, I/O interfaces, and terminal blocks. Each I/O interface carrier is equipped with a connector that allows an additional I/O interface carrier to be plugged on to it. Up to 64 I/O interfaces on eight 8-wide I/O interface carriers are supported by a single I/O subsystem. For the horizontal-mount solution, 1-wide local bus extenders allow you to continue the I/O bus on a different row of carriers. There are two types of 8-wide I/O interface carriers available. They both have connectors for field power on the top of the carrier. The original carrier connects each set of field power terminals to two I/O cards, and the other option have individual field power per card slot and is ideal if separate field power is required for redundant I/O cards.



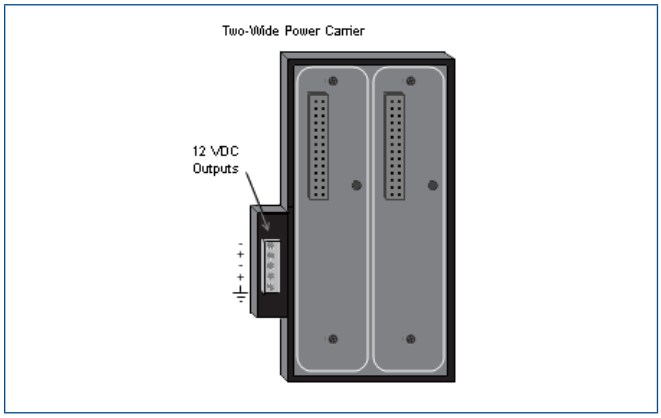
The DeltaV horizontal-mount 8-wide I/O interface carrier with individual field power per I/O card.

With the introduction of DeltaV SIS the left one-wide and right one-wide dual carrier extenders have two, 44-pin D- Shell connectors which supports dual cables for a fault tolerant configuration. The A and B connectors are in parallel so either port may be used. The new dual carrier extenders are a pre-requisite for DeltaV SIS as these also provide extension of the redundant safety bus used by the Safety Logic Solvers. The VerticalPLUS mount carriers also support dual cables and can be used with DeltaV SIS. Refer to the new VerticalPLUS Carrier Product Data Sheet for more details on these new carriers.



Front view of dual carrier extenders.

The horizontal carrier family also offers a 2-wide power carrier. Use this carrier, along with one or two system power supplies to provide 12 V DC local bus power connected through the carrier extenders. There are two 12 V DC output connections powered by either supply. For redundant power, ensure that the power demand is within the output range of one system power supply.



Two-Wide Power Carrier for power injection.

With the introduction of the PK controller, a 4 wide I/O carrier is available for use with M-series I/O cards when a smaller footprint for the hardware is required. The 4-wide carrier allows for individual field power per card slot and is ideal if separate field power is required for redundant I/O cards.

4-wide I/O card carrier with individual field power connections.

Hardware Specifications

Specifications for the I/O Subsystem Horizontal Carriers		
2-Wide Power/Controller Carrier		
Capacity	One system power supply and one controller or two system power supplies	
Dimensions	**Centimeters**	**Inches**
Height	16.5	6.5
Width	8.4	3.3
Depth	3.1	1.2
Connector to connector width	9.1	3.6
8-Wide I/O Carrier with field power per two I/O cards Specifications		
Capacity	Eight I/O cards and eight terminal blocks	
Dimensions	**Centimeters**	**Inches**
Height	16.5	6.5
Width	33.6	13.2
Depth	3.1	1.2
Current Ratings		
Backplane	8 A max (supplied to I/O cards)	
Bussed field power bus	6.5 A max (supplied to field terminals) per two I/O cards	
8-Wide I/O Carrier with separate field power for each I/O cards Specifications		
Capacity	Eight I/O cards and eight terminal blocks	
Dimensions	**Centimeters**	**Inches**
Height	16.9	6.7
Width	33.6	13.2
Depth	3.1	1.2
Current Ratings		
Backplane	8 A max (supplied to I/O cards)	
Bussed field power bus	3.2 A max (supplied to field terminals) per I/O card	

4-Wide I/O Carrier Specifications		
Capacity	Four I/O cards and four terminal blocks	
Dimensions	**Centimeters**	**Inches**
Height	16.9	6.7
Width	17.0	6.7
Depth	3.1	1.2
Current Ratings		
Backplane	8 A max (supplied to I/O cards)	
Bussed field power bus	3.2 A max (supplied to field terminals) per I/O card	
1-Wide I/O Carrier Extender (Left and Right) Specifications		
Capacity	Single or dual cables with SIS safety bus coax cables	
Dimensions	**Centimeters**	**Inches**
Height	16.5	6.5
Width	4.2	1.7
Depth	3.1	1.2
Current Ratings		
Backplane	8 A max (supplied to I/O cards)	
Injected Power connector (Left extender only)	8 A max (supplied to I/O cards)	

Environmental specifications (All Carrier components)	
Operating temperature *	-40 to 70°C (-40 to 158°F)
Storage temperature	-40 to 85°C (-40 to 185°F)
Relative humidity	5 to 95%, non-condensing
Airborne contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Shock (normal operating conditions)	10 g ½-sine wave for 11 ms
Vibration (operative limit)	1 mm peak-to-peak from 5 Hz to 16 Hz, 0.5 g from 16 Hz to 150 Hz

Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper for more information.*

Certifications

The following certifications are available on the M-series Horizontal Carriers.

- **CE:**

  EMC: EN 61326-1

- **FM:**

  FM 3600

  FM 3611

- **CSA:**

  CSA C22.2 No. 213

  CSA C22.2 No. 61010-1

- **ATEX:**

  EN 60079-0

  EN 60079-7

  EN 60079-15

- **IEC-Ex:**

  IEC60079-0

  EN 60079-7

  IEC60079-15

- **Marine Certifications: IACS E10**

  ABS Certificate of Design Assessment

  DNV GL Type Approval Certificate

Hazardous Area/Location

The M-series Horizontal Carriers can be installed and used based on the following Standards: (see actual certificates for exact product markings for each product)

- **FM (USA):**

  Installation:

  Class I, Division 2, Groups A, B, C, D, T4

- **cFM (Canada):**

  Installation:

  Class I, Division 2, Groups A, B, C, D, T4

- **ATEX:**

  II 3G Ex nA IIC T4 Gc

  II 3G Ex ec IIC T4 Gc

- **IEC-Ex:**

  II 3G Ex nA IIC T4 Gc

  II 3G Ex ec IIC T4 Gc

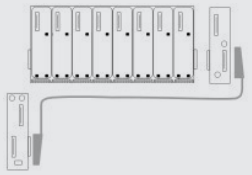
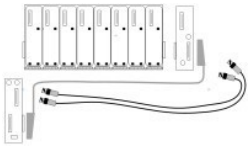
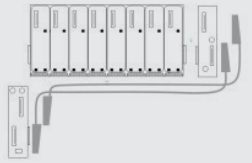
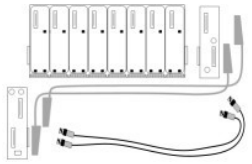
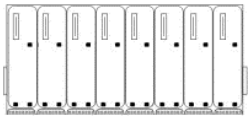
Regarding the Installation instructions please refer to the following Documents: Class 1 Division 2 Installation Instructions DeltaV M-series (12P1293) Zone 2 Installation Instructions DeltaV M-series (12P2046)

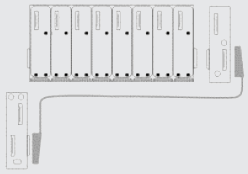
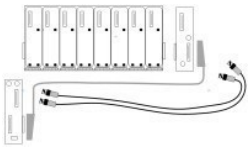
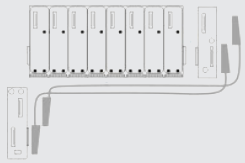
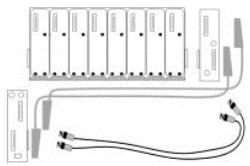
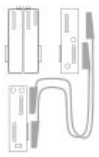
System Compatibility

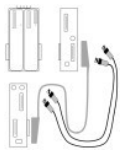
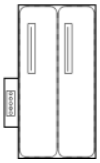
M-series I/O carriers are not physically compatible with S-series controller carriers, except when used with the DeltaV SIS Adapter.

The M-series controllers cannot detect the difference between an 8-wide and a 4-wide carrier. If a 4-wide carrier is used, the four I/O slots after the slots on the carrier will be lost to an M-series controller. If either a 4-wide or 8 wide carrier is connected after a 4-wide carrier, the first slot number will be 5 numbers higher than the last slot on the 4-wide carrier. For example, if a controller has a 4-wide carrier followed by an 8-wide carrier, the slots on the 4-wide carrier will be 1, 2, 3, and 4, and the slots on the 8-wide carrier will be slots 9,10, 11, 12, 13, 14, 15, 16. The PK controller does not have this behavior because it can distinguish between a 4-wide and an 8-wide carrier. However, there is still a limit of 8 total carriers (4-wides and/or 8-wides) on any controller.

Ordering Information

Description	View	Model Number
8-Wide I/O Interface Carrier with Carrier Shield Bar		VE4050S2K1C0
8-Wide I/O Interface Carrier with Carrier Shield Bar and Single Enhanced Carrier Extender Cable. Cable is 1.2m		VE4050E1C0
8-Wide I/O Interface Carrier with Carrier Shield Bar, Single Enhanced Carrier Extender Cable, and Redundant SISNet Coax Cables. Cables are 1.2m.		VE4050E1C2
8-Wide I/O Interface Carrier with Dual Carrier Extension Cable and Carrier Shield Bar. Cables are 1.2m.		VE4050E2C0
8-Wide I/O Interface Carrier with Carrier Shield Bar, Dual Enhanced Carrier Extender Cables, and Redundant SISNet Coax Cables. Cables are 1.2m.		VE4050E2C2
4-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card		VE4040E0C0
8-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card		VE4050S2K1C2

8-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card and Single Enhanced Carrier Extender Cable. Cable is 1.2m.		VE4050K1C0
8-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card, Single Enhanced Carrier Extender Cable, and Redundant SISNet Coax Cables. Cables are 1.2m		VE4050K1C2
8-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card, and Dual Carrier Extension Cable. Cables are 1.2m.		VE4050K2C0
8-Wide I/O Interface Carrier with Carrier Shield Bar and individual field power per card, Dual Enhanced Carrier Extender Cables, and Redundant SISNet Coax Cables. Cables are 1.2m.		VE4050K2C2
2-Wide Power/Controller Carrier		VE3051C0
2-Wide Power/Controller Carrier with Dual Enhanced Extender Cables. Cables are 1.2m.		VE3051C2
2-Wide Power/Controller Carrier with Single Enhanced Extender Cable. Cable is 1.2m.		VE3051C3

2-Wide Power/Controller Carrier with Single Enhanced Extender Cable and Redundant SISNet Coax Cables. Cables are 1.2m.		VE3051C5
Carrier Blank Cap		VE6101
Horizontal-Mount 2-Wide Power Carrier; 12 V DC Output		VE5056

Spare Part Ordering Information

Spare Parts	
Description	**Model Number**
0.8-meter, 44-pin Extender Cable for Horizontal Carriers	KJ4002X1-BF3
1.2-meter, 44-pin Extender Cable for Horizontal Carriers	KJ4002X1-BF2
1.5-meter, 44-pin Extender Cable for Horizontal Carriers	KJ4002X1-BF4
0.8m black Coax Extender Cable for DeltaV SIS	KJ4010X1-BL2
1.2m black Coax Extender Cable for DeltaV SIS	KJ4010X1-BL1
1.5m black Coax Extender Cable for DeltaV SIS	KJ4010X1-BL3
0.8m white Coax Extender Cable for DeltaV SIS	KJ4010X1-BM2
1.2m white Coax Extender Cable for DeltaV SIS	KJ4010X1-BM1
1.5m white Coax Extender Cable for DeltaV SIS	KJ4010X1-BM3

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+1 512 832 3774

Asia Pacific:
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Europe, Middle East:
+41 41 768 6111

www.emerson.com/deltav

DELTAV™

EMERSON™

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Please be informed that the data shown in this PDF Document is generated from our Online Catalog. Please find the complete data in the user's documentation. Our General Terms of Use for Downloads are valid (http://phoenixcontact.com/download)

Coupling relay for SIL 3 high and low-demand applications, couples digital output signals to the I/O, 1 enabling current path, 1 confirmation current path, safe state off applications, test pulse filter, fixed screw terminal block

Your advantages

- Up to SIL 3 according to IEC 61508
- Forcibly guided contacts according to EN 50205
- Easy proof test according to IEC 61508
- Low housing width of just 6.8 mm
- Long service life thanks to filtering of controller test pulses
- 1 enabling current path, 1 diagnostic current path
- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation

Key Commercial Data

Packing unit	1 pc
GTIN	4 055626 280240
GTIN	4055626280240
Weight per Piece (excluding packing)	71.490 g
Custom tariff number	85364900
Country of origin	Germany

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area

Dimensions

Width	6.8 mm
Height	93.1 mm

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Technical data

Dimensions

Depth	102.5 mm

Ambient conditions

Ambient temperature (operation)	-40 °C ... 70 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)
Maximum altitude	≤ 2000 m (Above sea level)

Power supply

Rated control circuit supply voltage U_S	24 V DC -15 % / +10 % (A1/A2)
	20.4 V DC ... 26.4 V DC
Rated control supply current I_S	typ. 45 mA
Power consumption at U_S	typ. 1.08 W
Inrush current	typ. 150 mA (Δt < 5 ms at U_s)
Filter time	max. 3 ms (at A1-A2 in the event of voltage dips at U_s)
	max. 3 ms (at A1-A2; low test pulse width)
	≥ 50 ms (at A1-A2; low test pulse rate)
	max. 17 ms (at A1-A2; high test pulse width)
	≥ 600 ms (at A1-A2; high test pulse rate)
Diagnostic supply voltage U_D	24 V DC -15 % / +10 % (21/0V)
Input current at U_D	6 mA (at the contacts 21/0V for U_D; + 100 mA depending on load at contact 22)
Inrush current at U_D	typ. 200 mA (Δt < 1 ms; for contacts 21 - 0 V at U_D)
Protective circuit	Serial protection against polarity reversal 33 V suppressor diode (A1-A2)33 V suppressor diode (21/0V)

Relay outputs: enabling current path

Output name	Enabling current path
Output description	2 N/O contacts in series, without delay, floating
Number of outputs	1 (safety-related N/O contacts: 13/14)
Contact type	1 enabling current path
Contact material	$AgSnO_2$
Switching voltage	min. 12 V AC/DC
	max. 250 V AC/DC (Observe the load curve)
Limiting continuous current	6 A (High demand)
	4 A (Low demand)
Inrush current	min. 3 mA
	max. 6 A
Sq. Total current	36 A^2 (observe derating)
Switching capacity	min. 60 mW
Switching frequency	max. 1 Hz

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Technical data

Relay outputs: enabling current path

Mechanical service life	10x 10^6 cycles
Switching capacity according to IEC 60947-5-1	4 A (24 V (DC13))
	5 A (250 V (AC15))
Output fuse	6 A gL/gG
	4 A gL/gG (for low-demand applications)

Relay outputs: return current/signaling current path

Output name	Confirmation current path
Output description	2 N/C contacts in series, without delay, not floating (reference ground: A2)
Number of outputs	1 (safety-related N/C contacts: 21/22)
Contact type	1 confirmation current path
Contact material	AgCuNi, + Au
Output voltage	Output of diagnostic supply voltage at contact 22: U_D - 1.6 V
Switching voltage	min. 20.4 V DC
	max. 26.4 V DC
Limiting continuous current	100 mA
Inrush current	min. 1 mA
	max. 100 mA
Switching capacity	min. 20 mW
Switching frequency	max. 1 Hz
Mechanical service life	10x 10^6 cycles
Output fuse	150 mA Fast-blow

Times

Typical pickup time at US	< 150 ms (with U_s when controlled via A1)
Typical release time at US	< 30 ms (when controlled via A1)
Recovery time	500 ms

General

Relay type	Electromechanical relay with forcibly guided contacts in accordance with IEC/EN 61810-3 (EN 50205)
Nominal operating mode	100% operating factor
Net weight	71.494 g
Mounting position	vertical or horizontal
Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Housing material	PBT
Housing color	yellow
Operating voltage display	1 x yellow LED
Status display	2 x green LEDs

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Technical data

General

Indication	1 x red LED

Connection data

Connection method	Screw connection
pluggable	no
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	2.5 mm²
Conductor cross section AWG min.	26
Conductor cross section AWG max.	12
Stripping length	12 mm
Screw thread	M3
Torque	0.5 Nm ... 0.6 Nm

Safety-related characteristic data

Stop category	0
Designation	IEC 61508 - High demand
Safety Integrity Level (SIL)	3
Designation	IEC 61508 - Low demand
Safety Integrity Level (SIL)	3
Designation	EN 50156-2
Safety Integrity Level (SIL)	3 (Reference IEC 61508)

Standards and Regulations

Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	DIN EN 50178, EN 60079-15
Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing
	Safe isolation, 6 kV reinforced insulation from the control circuit (A1/A2) and diagnostics circuit (0V/21/22) to the enabling current path (13/14)
Degree of pollution	2
Overvoltage category	III
Shock	15g
Vibration (operation)	10 Hz ... 150 Hz, 2g
Conformance	CE-compliant
ATEX	# II 3 G Ex nA nC IIC T4 Gc
IECEx	Ex nA nC IIC T4 Gc
UL, USA/Canada	cULus
	Class I, Zone 2, AEx nA nC IIC T4 / Ex nA nC IIC Gc T4 X
	Class I, Div. 2, Groups A, B, C, D, T4
Environmental simulation test	ISA-S71.04 (G3)

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Technical data

Environmental Product Compliance

REACh SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab “Downloads”, Category “Manufacturer's declaration”

Classifications

eCl@ss

eCl@ss 5.1	27371901
eCl@ss 6.0	27371800
eCl@ss 7.0	27371819
eCl@ss 8.0	27371819
eCl@ss 9.0	27371819

ETIM

ETIM 5.0	EC001449
ETIM 6.0	EC001449
ETIM 7.0	EC001449

Approvals

Approvals

Approvals

UL Listed / cUL Listed / Functional Safety / EAC / cULus Listed

Ex Approvals

UL Listed / cUL Listed / cULus Listed

Approval details

UL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 140324

cUL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 140324

Coupling relay - PSR-PS22-1NO-1NC-24VDC-SC - 2702524

Approvals

Functional Safety		44-780-15124306
EAC		RU C-DE.A*30.B.01082
cULus Listed		

QUINT-DIODE/12-24DC/2X20/1X40

Redundancy module

Data sheet
104690_en_01

1 Description

Using the redundancy module, it is possible for two power supply units of the same type that are connected in parallel on the output side to increase performance or for redundancy to be isolated from one another.

The reliability of a power supply determines the availability of individual components in a system and whether complex systems can function safely.

Redundant circuits are intended to supply systems that set high demands on operational reliability. Long-term, permanent system availability is ensured by the redundant setup of the power supply.

The power supply of a system can be configured redundantly by switching at least two power supply units in parallel. Together, they then supply the connected devices.

The power supply units involved must be dimensioned to enable the total current requirements of all loads to be covered by one single power supply unit. In the event of an internal device fault or failure of the mains power supply on the primary side, the other device automatically takes over the entire power supply of the loads without interruption.

If the devices connected upstream are QUINT POWER power supply units, redundance can also be monitored via series connection of the DC-OK relay contacts.

This means that operational reliability of the entire system can be effectively increased.

Features

- Decoupling power supply units switched in parallel
- Installation in potentially explosive areas is permitted
- Load currents up to 60 A are possible
- Easy installation by snapping onto the DIN rail

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

This data sheet is valid for all products listed on the following page:

2 Table of contents

3 Ordering data

Description	Type	Order No.	Pcs. / Pkt.
DIN rail diode module 12-24 V DC/2x20 A or 1x40 A. Uniform redundancy up to the consumer.	QUINT-DIODE/12-24DC/2X20/1X40	2320157	1

Accessories	Type	Order No.	Pcs. / Pkt.
Universal wall adapter	UWA 182/52	2938235	1
Assembly adapter for QUINT-PS... power supply on S7-300 rail	QUINT-PS-ADAPTERS7/1	2938196	1
Universal DIN rail adapter	UTA 107/30	2320089	100

Our range of accessories is being continually extended, our current range can be found in the download area.

4 Technical data

Input data/output data	
Nominal input/output voltage	12 V DC ... 24 V DC
DC input / output voltage range	10 V DC ... 30 V DC
Voltage drop, input/output	0.5 V
Nominal current	2x 20 A (-25 °C ... 60 °C) 1x 40 A (-25 °C ... 60 °C)
Maximum current	2x 30 A (-25°C ... 40°C) 1x 60 A (-25°C ... 40°C)
Transient surge protection	Varistor
Protection against polarity reversal	Yes, < 60 V
Output current	40 A (Increasing power) 20 A (Redundancy)
Derating	60 °C ... 70 °C (2.5%/K)
Power loss nominal load max.	10 W (I_{OUT} = 20 A)
Efficiency	> 97 %

General data	
Insulation voltage input, output / housing	500 V
MTBF	40000000 h
Mounting position	horizontal DIN rail NS 35, EN 60715
Housing material	Steel sheet, zinc-plated
Dimensions W/H/D	50 mm / 130 mm / 125 mm
Weight	0.75 kg

Security	
Degree of protection	IP20
Protection class	III
SELV	IEC 60950-1 (SELV) and EN 60204 (PELV)

Input connection data	
Connection method	Screw connection
Conductor cross section, solid	0.2 mm² ... 6 mm²
Conductor cross section, stranded	0.2 mm² ... 4 mm²
Conductor cross section AWG/kcmil	12 ... 10
Stripping length	7 mm
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm

Output connection data	
Connection method	Screw connection
Conductor cross section, solid	0.5 mm² ... 16 mm²
Conductor cross section, stranded	0.5 mm² ... 16 mm²
Conductor cross section AWG/kcmil	10
Stripping length	10 mm
Screw thread	M4
Tightening torque	1.2 Nm ... 1.5 Nm

Ambient conditions

Ambient temperature (operation)	-40 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min.
Shock	30g in each direction, according to IEC 60068-2-27
Pollution degree in acc. with EN 50178	2
Climatic class	3K3 (in acc. with EN 60721)

Approvals

ATEX	Ⓔx II 3G Ex nA IIC T4 Gc KEMA 10 ATEX 0165X
IECEx	Ex nA IIC T4 Gc IECEx KEM 10.0091
UL approvals	UL/C-UL listed UL 508 UL/C-UL Recognized UL 60950 UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

Current approvals/permissions for the product can be found in the download area under phoenixcontact.net/products.

Conformance with EMC Directive 2004/108/EC		
Noise immunity according to EN 61000-6-2		
Electrostatic discharge	EN 61000-4-2	
	Housing	Level 4
	Contact discharge	8 kV
	Discharge in air	15 kV
	Comments	Criterion A
Electromagnetic HF field	EN 61000-4-3	
	Housing	Level 3
	Frequency range	80 MHz ... 1 GHz
	Frequency range	1 GHz ... 3 GHz
	Comments	Criterion A
Fast transients (burst)	EN 61000-4-4	
	Input	2 kV (level 3 - asymmetrical: conductor to ground)
	Output	2 kV (level 3 - asymmetrical: conductor to ground)
	Comments	Criterion A
Surge current loads (surge)	EN 61000-4-5	
	Input	2 kV (level 3 - asymmetrical: conductor to ground) 1 kV (Level 2 - symmetrical: Conductor to conductor)
	Output	2 kV (level 3 - asymmetrical: conductor to ground) 1 kV (Level 2 - symmetrical: Conductor to conductor)
	Comments	Criterion A
Conducted interference	EN 61000-4-6	
	Input/output	Level 3
	Frequency range	0.15 MHz ... 80 MHz
	Comments	Criterion A

Emitted interference in acc. with EN 61000-6-3	
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential

All technical specifications are nominal values and refer to a room temperature of 25 °C and 70 % relative humidity at 100 m above sea level.

5 Safety regulations and installation notes

DANGER

Never carry out work when voltage is present.

CAUTION:

Before startup please ensure:

All feed lines are sufficiently protected and dimensioned!

All output lines are dimensioned according to the maximum output current of the device or separately protected!

Sufficient convection must be guaranteed.

Do not exceed max. input/output current of 60 A. Use current-limited source, e. g., QUINT POWER or suitable fuse.

The connection must be carried out by a competent person and protection against electric shock guaranteed.

The redundancy module is a device installing into an enclosed space. Installation and start-up may only be carried out by qualified personnel. The relevant country-specific regulations must be observed.

Observe mechanical and thermal limits.

The redundancy module is maintenance-free. Repairs may only be carried out by the manufacturer.

CAUTION:

Installation in zone 2

Observe the specified conditions for use in potentially explosive areas.

Install the device in a suitable approved housing (with at least IP54 protection) that meets the requirements of EN 60079-15.

The device is not designed for use in potentially dust-explosive atmospheres. If dust is present, install the device in suitable, approved housing.

The device must be stopped and immediately removed from the Ex area if it is damaged or was subject to an impermissible load or stored incorrectly or if it malfunctions.

The device is designed for installation in zone 2 potentially explosive areas according to Directive 94/4/EC.

Within a potentially explosive area, the redundancy module is to be connected to the equipotential bonding system via a 35 mm DIN rail (EN 60715).

6 Structure

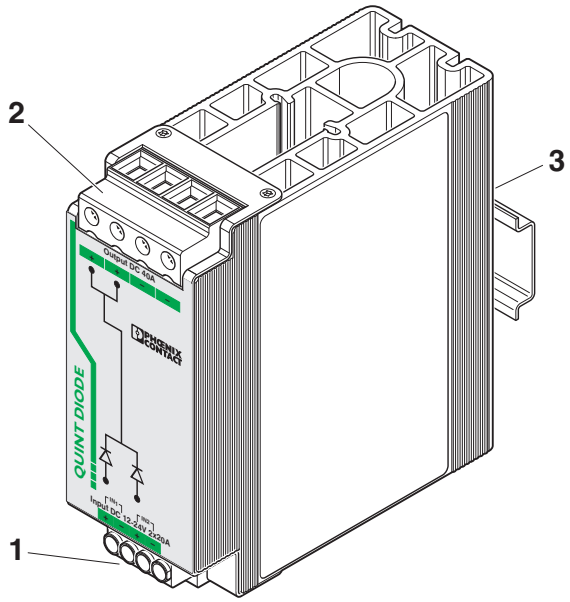


Figure 1 Function elements

1 IN1/IN2 DC input:
12 ... 24 V input voltage, I_N = 2 x 20 A

2 DC output

3 Universal snap-on foot: 35 mm DIN rails according to EN 60715 and panel mounting with UWA 182/52

7 Installation

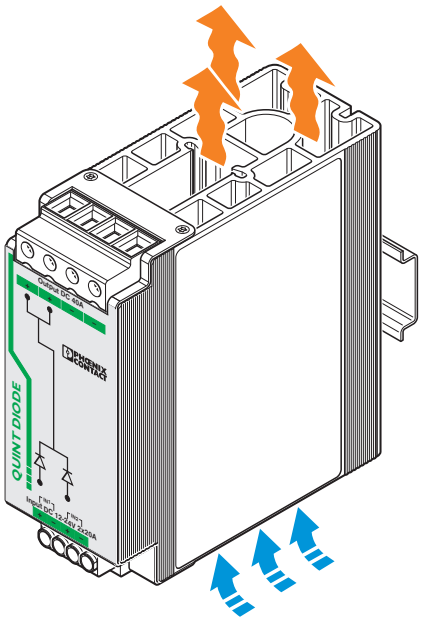


Figure 2 Convection

In order to ensure sufficient convection, we recommend a minimum vertical distance of 50 mm to the other modules.
A lateral distance of 5 mm, and in the case of active components, that of 15 mm is necessary for proper functioning of the module.
Depending on the ambient temperature and the load of the module, the housing can become very hot.

The module can be snapped onto all DIN rails according to EN 60715 and should be mounted in the normal mounting position (horizontal device orientation, connection terminal blocks on top and bottom).

8 Mounting position

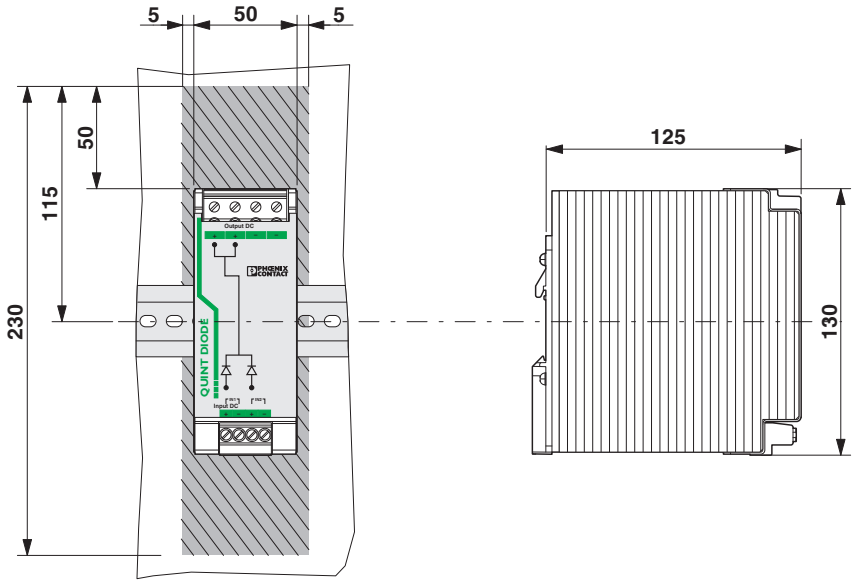


Figure 3 Installation dimensions

Installation depth 125 mm

9 Mounting on DIN rails

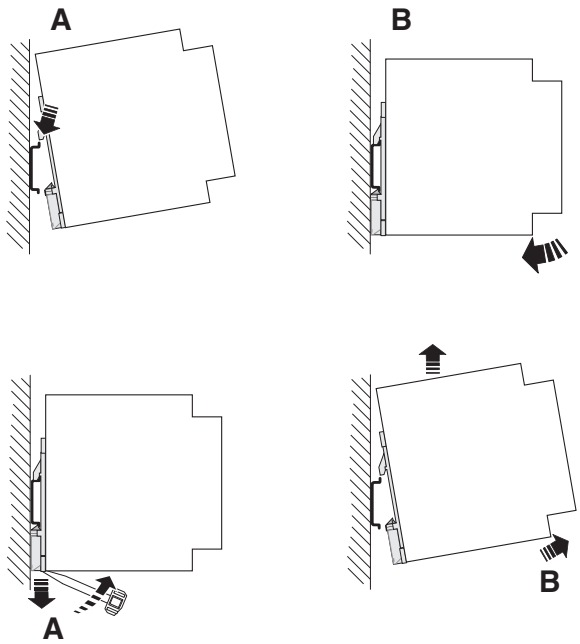


Figure 4 Mounting and removing

Assembly

Position the module with the DIN rail guide on the upper edge of the DIN rail, and snap it in with a downward motion.

Removing

Pull the snap lever open with the aid of a screwdriver and slide the module out at the lower edge of the DIN rail.

10 Input

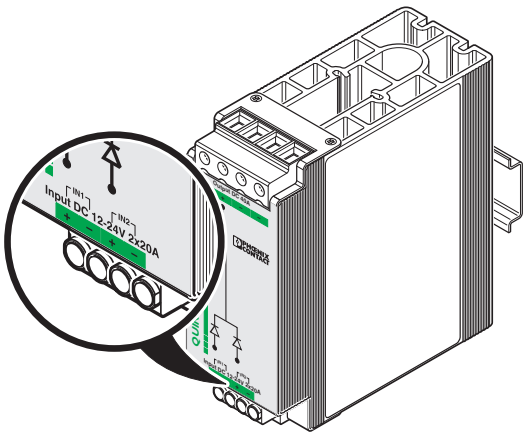


Figure 5 Input

The input voltages are connected via the Input DC +/+ screw connections (IN1, IN2).

Use connecting cables of the same length with identical cable cross section for this.

Protection of the primary side

The maximum current for each input is 30 A.

Therefore use a current-limited source (e. g., QUINT POWER) or a suitable fuse.

11 Output

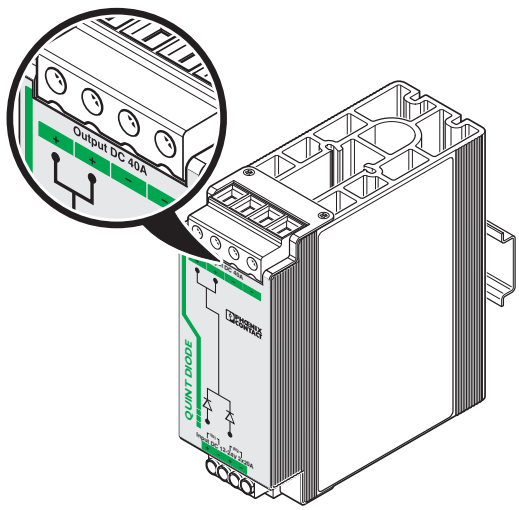


Figure 6 Output

The output voltage is connected via the Output DC +/+ and -/- screw connections.

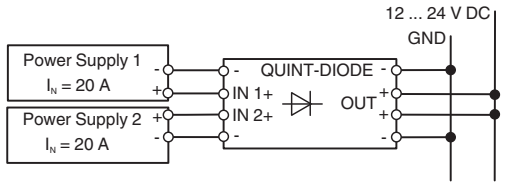
12 Function

12.1 Input

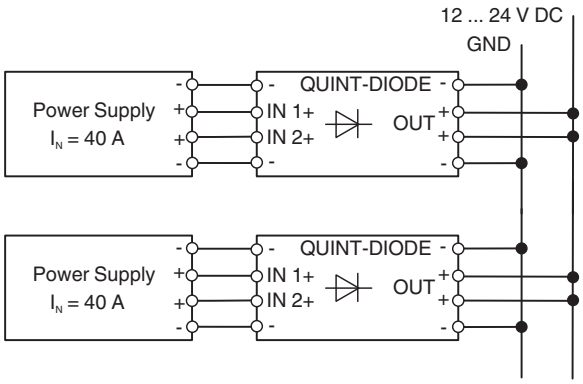
The maximum permissible current depends on the cross section of the connected cables and the ambient temperature.

Conductor cross section	Ambient temperature		
	40 °C	50 °C	60 °C
6 mm² / 10 AWG	2 x 19 A 1 x 39 A	2 x 18 A 1 x 36 A	2 x 16 A 1 x 32 A
10 mm² / 8 AWG	2 x 27 A 1 x 54 A	2 x 25 A 1 x 50 A	2 x 21 A 1 x 43 A
16 mm² / 6 AWG	2 x 30 A 1 x 60 A	2 x 27 A 1 x 55 A	2 x 24 A 1 x 48 A

Only one redundancy module is required for decoupling two power supply units 1 and 2 switched in parallel with nominal currents of up to 20 A.



One redundancy module per power supply is required to decouple power supplies with nominal currents from 20 A to 40 A. Inputs 1 and 2 on the redundancy module must be connected to the power supply unit using two conductors. This is necessary because the maximum current carrying capacity of 30 A per input must not be exceeded. To connect the redundancy module to the power supply unit, we recommend using two conductors of the same length and with an identical cross section.



12.2 Output

Only devices suitable for operation in the potentially explosive areas of zone 2 may be connected to the output of the redundancy module in zone 2.

Wire the load with the plus and minus terminals to the output of the redundancy module.

12.3 Temperature response

Horizontal mounting position

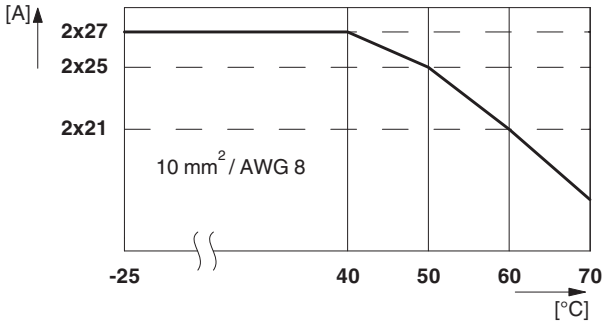


Figure 7 Derating diagram

In the horizontal mounting position (input terminal blocks facing upwards or downwards), the redundancy module can carry current loads up to a maximum of 2 x 27 A or 1 x 54 A at an ambient temperature up to 40 °C. Depending on the ambient temperature, the permissible current carrying capacity is reduced in the case of a conductor cross section of 10 mm².

A maximum of 2 x 21 A or 1 x 43 A can be permanently carried at an ambient temperature of 60 °C.

QUINT-PS/1AC/24DC/ 5

Power supply unit

Data sheet
103127_en_06

1 Description

QUINT POWER power supply units – Superior system availability with SFB technology
Compact power supply units of the new QUINT POWER generation maximize the availability of your system. With the SFB technology (Selective Fuse Breaking Technology), six times the nominal current for 12 ms, even the standard power circuit-breakers can now also be triggered reliably and quickly. Faulty current paths are switched off selectively, the fault is located and important system parts continue to operate. Comprehensive diagnostics are provided through constant monitoring of output voltage and current. This preventive function monitoring visualizes critical operating modes and reports them to the control unit before an error can occur.

Features

Superior system availability

- Using SFB technology (6 times the nominal current for 12 ms), circuit breakers are tripped quickly and important system parts remain in operation
- Through the preventive monitoring of output voltage and current and the transmission of critical operating states to the controller
- Through reliable starting of difficult loads with POWER BOOST power reserve
- Long mains buffering > 55 ms
- High MTBF > 635,000 h (40°C)

Worldwide use

- Input voltage from 85 V AC ... 264 V AC
- Input voltage from 90 V DC ... 350 V DC

Flexible use

- Adjustable output voltage
- Can be used in Class I, Division 2, Groups A, B, C, D (Hazardous Location) ANSI-ISA 12.12

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

2 Table of contents

3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Primary-switched QUINT POWER power supply for DIN rail mounting with SFB (Selective Fuse Breaking) Technology, input: 1-phase, output: 24 V DC/5 A	QUINT-PS/1AC/24DC/ 5	2866750	1

Accessories	Type	Order No.	Pcs./Pkt.
Universal DIN rail adapter	UTA 107/30	2320089	100
Universal wall adapter	UWA 182/52	2938235	1
Assembly adapter for QUINT-PS... power supply on S7-300 rail	QUINT-PS-ADAPTERS7/1	2938196	1
The fan for QUINT-PS/1AC and .../3AC can be mounted without the need for tools or other accessories. By using the fan, optimum cooling is ensured at high ambient temperatures or if the mounting position is rotated.	QUINT-PS/FAN/4	2320076	1
DIN rail diode module 12-24 V DC/2x20 A or 1x40 A. Uniform redundancy up to the consumer.	QUINT-DIODE/12-24DC/2X20/1X40	2320157	1
Active QUINT redundancy module for DIN rail mounting with ACB technology (Active Current Balancing) and monitoring functions, input: 24 V DC, output: 24 V DC/2 x 10 A or 1 x 20 A, including mounted universal DIN rail adapter UTA 107/30	QUINT-ORING/24DC/2X10/1X20	2320173	1
Redundancy module with function monitoring, 12-24 V DC, 2x 10 A, 1x 20 A	TRIO-DIODE/12-24DC/2X10/1X20	2866514	1
Thermomagnetic device circuit breaker, 1-pos., tripping characteristic SFB, 1 PDT contact, plug for base element.	CB TM1 1A SFB P	2800836	1
Thermomagnetic device circuit breaker, 1-pos., tripping characteristic SFB, 1 PDT contact, plug for base element.	CB TM1 2A SFB P	2800837	1

Our range of accessories is being continually extended, our current range can be found in the download area.

4 Technical data

Input data	
Nominal input voltage	100 V AC ... 240 V AC
Input voltage range	85 V AC ... 264 V AC
Short-term input voltage	300 V AC
Input voltage range	90 V DC ... 350 V DC
AC frequency range	45 Hz ... 65 Hz
Frequency range DC	0 Hz
Current consumption	1.2 A (120 V AC) 0.6 A (230 V AC) 1.3 A (110 V DC) 0.6 A (220 V DC)
Inrush current limitation	< 15 A (typical)
I^2t	< 1 A^2s
Power failure bypass	> 55 ms (120 V AC) > 55 ms (230 V AC)
Typical response time	< 0.15 s
Protective circuit	Transient surge protection Varistor
Input fuse, integrated	5 A (slow-blow, internal)
Choice of suitable fuses	6 A ... 16 A (AC: Characteristics B, C, D, K)
Discharge current to PE	< 3.5 mA

Output data	
Nominal output voltage	24 V DC ±1 %
Setting range of the output voltage	18 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)
Output current	5 A (-25°C ... 60°C, U_{OUT} = 24 V DC) 7.5 A (with POWER BOOST, -25°C ... 40°C permanently, U_{OUT} = 24 V DC) 30 A (SFB technology, 12 ms) 7.5 A (U_{In} ≥ 100 V AC)
Magnetic fuse tripping	B2 / B4 / C2
Control deviation	< 1 % (change in load, static 10 % ... 90 %) < 2 % (change in load, dynamic 10 % ... 90 %) < 0.1 % (change in input voltage ±10 %)
Efficiency	> 90 % (for 230 V AC and nominal values)
Rise time	< 0.1 s (U_{OUT} (10 % ... 90 %))
Residual ripple	< 40 mV_{PP} (with nominal values)
Connection in parallel	Yes, for redundancy and increased capacity
Connection in series	Yes
Protection against surge voltage on the output	< 35 V DC
Resistance to reverse feed	max. 35 V DC

Power consumption	
Maximum power dissipation NO-Load	3 W
Power loss nominal load max.	15 W

DC OK active	
Output description	U_{OUT} > 0.9 x U_N: High signal
Voltage/current	18 V DC ... 24 V DC / ≤ 20 mA (short-circuit resistant)
Status display	U_{OUT} > 0.9 x U_N: "DC OK" LED green / U_{OUT} < 0.9 x U_N: Flashing "DC OK" LED

DC OK floating	
Output description	Relay contact, U_{OUT} > 0.9 x U_N: Contact closed
Voltage/current	30 V AC/DC / 0.5 A , 24 V DC / 1 A
Status display	U_{OUT} > 0.9 x U_N: "DC OK" LED green / U_{OUT} < 0.9 x U_N: Flashing "DC OK" LED

POWER BOOST, active	
Output description	I_{OUT} < I_N: High signal
Voltage/current	18 V DC ... 24 V DC / ≤ 20 mA (short-circuit resistant)
Status display	I_{OUT} > I_N: LED "BOOST" yellow

General data	
Insulation voltage input/output	4 kV AC (type test) 2 kV AC (routine test)
Insulation voltage input / PE	3.5 kV AC (type test) 2 kV AC (routine test)
Insulation voltage output / PE	500 V DC (routine test)
Degree of protection	IP20
Protection class	I
MTBF (IEC 61709, SN 29500)	> 635000 h (40°C) / > 1134000 h (25 °C)
Side element version	Aluminum
Hood version	Galvanized sheet steel, free from chrome (VI)
Dimensions W / H / D (state of delivery)	40 mm / 130 mm / 125 mm
Dimensions W / H / D (90° turned)	122 mm / 130 mm / 43 mm
Weight	0.7 kg

Ambient conditions	
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (start-up type tested)	-40 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Maximum altitude	6000 m
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min.
Shock	30g in each direction, according to IEC 60068-2-27
Pollution degree in acc. with EN 60950-1	2
Climatic class	3K3 (in acc. with EN 60721)

Standards	
Electrical Equipment for Machinery	EN 60204-1
Electrical safety (of information technology equipment)	IEC 60950-1/VDE 0805 (SELV)
Electronic equipment for use in electrical power installations	EN 50178/VDE 0160 (PELV) / Overvoltage category III
SELV	IEC 60950-1 (SELV) and EN 60204-1 (PELV)
Safe isolation	DIN VDE 0100-410
Limitation of mains harmonic currents	EN 61000-3-2
Network version/undervoltage	SEMI F47-0706 Compliance Certificate
Medical standard	IEC 60601-1, 2 x MOOP
Rail applications	EN 50121-4

Approvals

UL	UL Listed UL 508 UL/C-UL Recognized UL 60950-1 UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)
CSA	CAN/CSA-C22.2 No. 60950-1-07 CSA-C22.2 No. 107.1-01
SIQ	CB Scheme
Shipbuilding	Germanischer Lloyd (EMC 2), ABS, LR, RINA, NK, DNV, BV
DeviceNet™	DeviceNet™ Power Supply Conformance Tested

Current approvals/permissions for the product can be found in the download area under phoenixcontact.net/products.

Conformance with EMC Directive 2004/108/EC		
Noise immunity according to EN 61000-6-2		
	EN 61000-6-2 requirement	**Tested**
Electrostatic discharge EN 61000-4-2		
Housing contact discharge	4 kV (Test intensity 2)	8 kV (Test intensity 4)
Housing air discharge	8 kV (Test intensity 3)	15 kV (Test intensity 4)
Comments	Criterion B	Criterion A
Electromagnetic HF field EN 61000-4-3		
Frequency range	80 MHz ... 1 GHz	80 MHz ... 1 GHz
Test field strength	10 V/m (Test intensity 3)	20 V/m (Test intensity 3)
Frequency range	1.4 GHz ... 2 GHz	1 GHz ... 2 GHz
Test field strength	3 V/m (Test intensity 2)	10 V/m (Test intensity 3)
Frequency range	2 GHz ... 2.7 GHz	2 GHz ... 3 GHz
Test field strength	1 V/m (Test intensity 1)	10 V/m (Test intensity 3)
Comments	Criterion A	Criterion A
Fast transients (burst) EN 61000-4-4		
Input	2 kV (Test intensity 3 - asymmetrical)	4 kV (Test intensity 4 - asymmetrical)
Output	2 kV (Test intensity 3 - asymmetrical)	2 kV (Test intensity 3 - asymmetrical)
Signal	1 kV (Test intensity 3 - asymmetrical)	2 kV (Test intensity 4 - asymmetrical)
Comments	Criterion B	Criterion A
Surge current loads (surge) EN 61000-4-5		
Input	1 kV (Test intensity 2 - symmetrical) 2 kV (Test intensity 3 - asymmetrical)	2 kV (Test intensity 3 - symmetrical) 4 kV (Test intensity 4 - asymmetrical)
Output	0.5 kV (Test intensity 1 - symmetrical) 0.5 kV (Test intensity 1 - asymmetrical)	1 kV (Test intensity 2 - symmetrical) 2 kV (Test intensity 3 - asymmetrical)
Signal	1 kV (Test intensity 2 - asymmetrical)	1 kV (Test intensity 2 - asymmetrical)
Comments	Criterion B	Criterion A
Conducted interference EN 61000-4-6		
Input/Output/Signal	asymmetrical	asymmetrical
Frequency range	0.15 MHz ... 80 MHz	0.15 MHz ... 80 MHz
Voltage	10 V (Test intensity 3)	10 V (Test intensity 3)
Comments	Criterion A	Criterion A

Key	
Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Emitted interference in acc. with EN 61000-6-3	
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential

All technical specifications are nominal values and refer to a room temperature of 25 °C and 70 % relative humidity at 100 m above sea level.

5 Safety regulations and installation notes

EXPLOSION HAZARD!

Only remove equipment when it is disconnected and not in the potentially explosive area.

DANGER

Components with dangerously high voltage and high stored energy are located in the device!
Never carry out work on live parts!
Depending on the ambient temperature and the load, the housing can become very hot!

CAUTION:

Before startup please ensure:

The connection must be carried out by a competent person and protection against electric shock guaranteed.

It must be possible to switch off power to device according to EN 60950.

All feed lines are sufficiently protected and dimensioned!

All output lines are dimensioned according to the maximum output current of the device or separately protected!

Sufficient convection must be guaranteed.

Observe mechanical and thermal limits.

CAUTION: Risk of injury

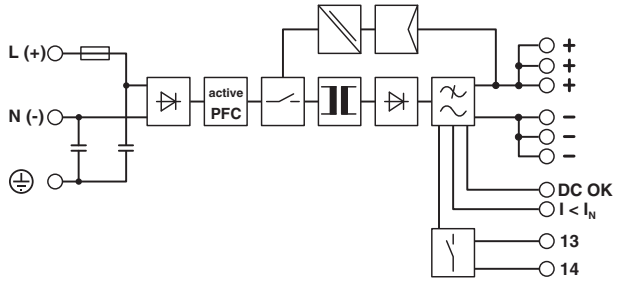
Cover termination area after installation in order to avoid accidental contact with live parts (e. g., installation in control cabinet).

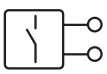
NOTE: Danger if used improperly

The power supply units are built-in devices. The device may only be installed and put into operation by qualified personnel. The corresponding national regulations must be observed.

6 Structure

6.1 Block diagram



Element	Meaning
	Rectification
	Power factor correction filter
	Switch
	Electrically isolated signal transmission
	Regulation
	Transformer
	Output filter
	Floating switching output

6.2 Function elements

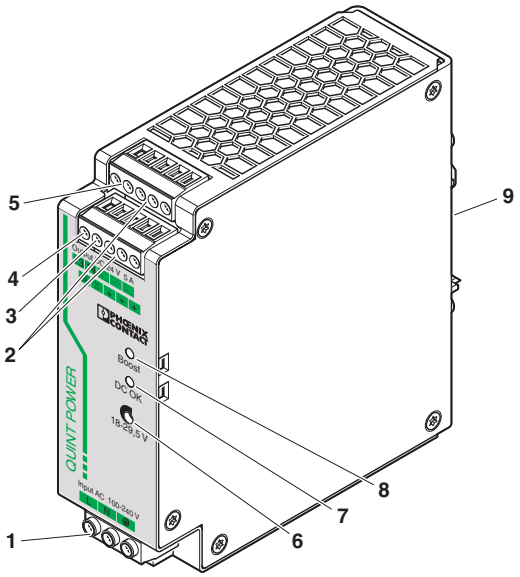


Figure 1 Position of the function elements

No.	Connection terminal blocks and function elements
1	AC input
2	DC output
3	Active signal output $I < I_N$ (POWER BOOST)
4	Active DC OK signal output
5	Floating DC OK switching output
6	Potentiometer for setting the output voltage
7	DC OK signal LED, green
8	Signal LED boost, yellow
9	Universal DIN rail adapter

6.3 Convection

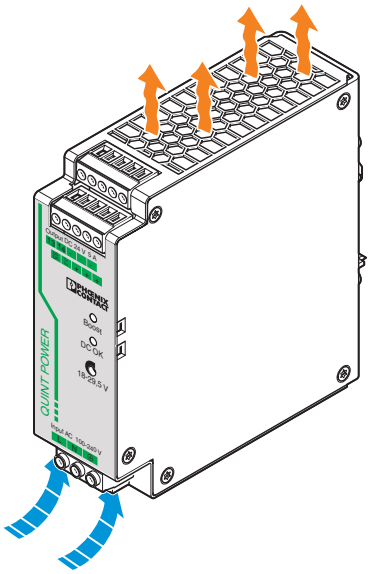


Figure 2 Convection

NOTE: enable convection

The housing can become very hot, depending on the ambient temperature and module load.

To enable sufficient convection, we recommend a minimum vertical clearance of 50 mm from other modules. In order to ensure proper functioning of the module, it is necessary to maintain a lateral distance of 5 mm and 15 mm for active components.

The device can be snapped onto all DIN rails in accordance with EN 60715 and should be mounted in the normal mounting position (connection terminal blocks on top and bottom).

6.4 Mounting position

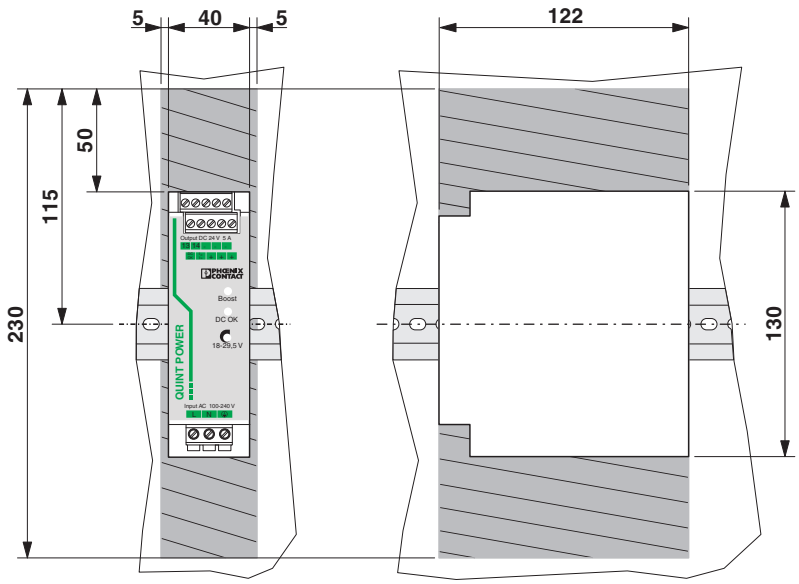


Figure 3 Locked areas

Possible mounting positions:

Normal mounting position, installation depth 125 mm (+ DIN rail) (delivery state)

Mounting position rotated at 90°, installation depth of 43 mm (+ DIN rail)

7 Mounting/removal

7.1 Normal mounting position

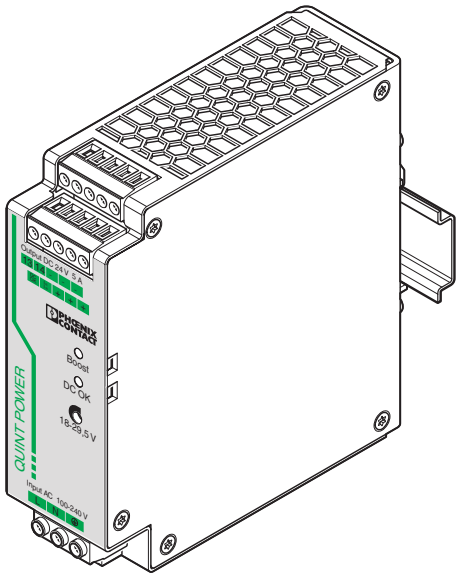


Figure 4 Normal mounting position

7.2 Mounting position rotated 90°

For a mounting position rotated at 90° to the DIN rail, mount the DIN rail adapter (UTA 107) as shown in the figure. No additional assembly material is required. Mounting screws: Torx® T10 (0.8 Nm ... 0.9 Nm tightening torque).

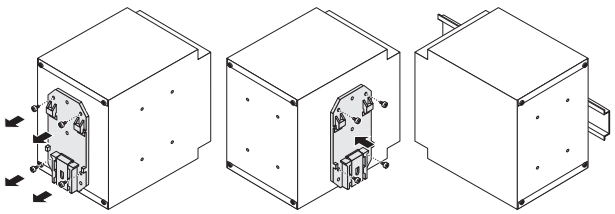


Figure 5 Mounting position rotated 90°

7.3 Mounting on a DIN rail

Position the module with the DIN rail guide on the upper edge of the DIN rail, and snap it in with a downward motion.

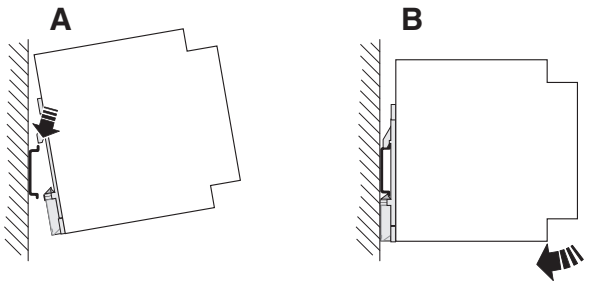


Figure 6 Assembly

7.4 Removal from the DIN rail

Pull the snap lever open with the aid of a screwdriver and slide the module out at the lower edge of the DIN rail.

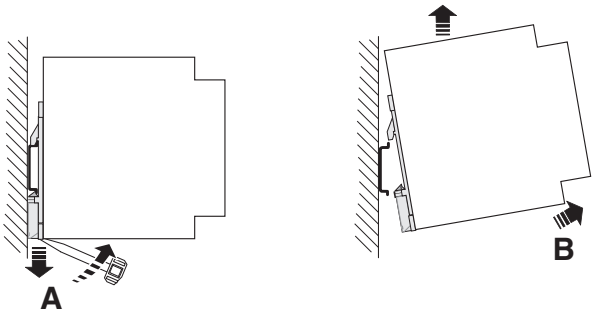


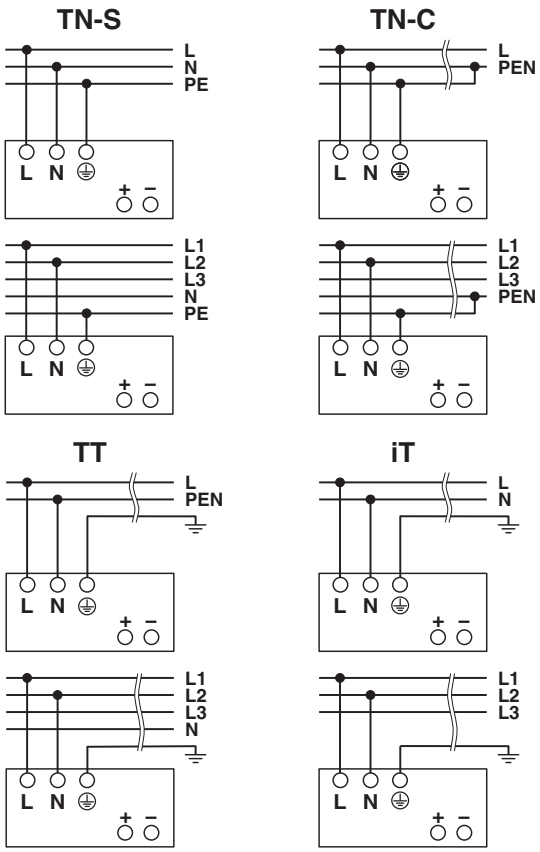
Figure 7 Removal

8 Device connection

8.1 Network types

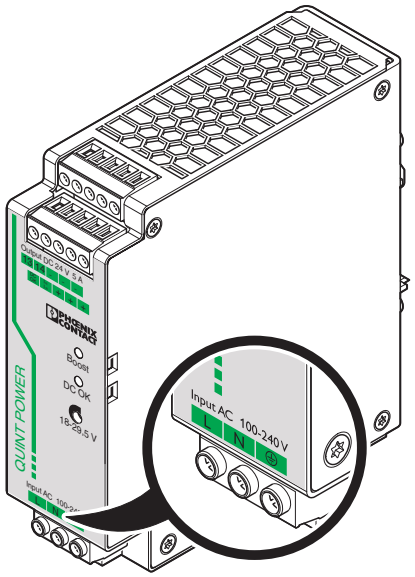
The device can be connected to 1-phase AC networks or to two of the phase conductors of 3-phase systems (TN, TT or IT system according to VDE 0100-300/IEC 60364-3) with nominal voltages of 100 V AC ... 240 V AC.

For operation on two of the phase conductors of a three-phase system, an isolating facility for all poles must be provided.



8.2 AC input

The supply voltage is connected via "Input AC 100 - 240 V" connection terminal blocks.



8.2.1 Protection of the primary side

The device must be installed in acc. with the regulations as in EN 60950. It must be possible to disconnect the device using a suitable isolating facility outside the power supply. Primary circuit mains protection, for example, is suitable for this purpose.

An internal fuse is provided for device protection. Additional device protection is not required.

8.2.2 Permissible backup fuse for mains protection

Power circuit-breaker 6 A, 10 A or 16 A, characteristic B (or identical function).

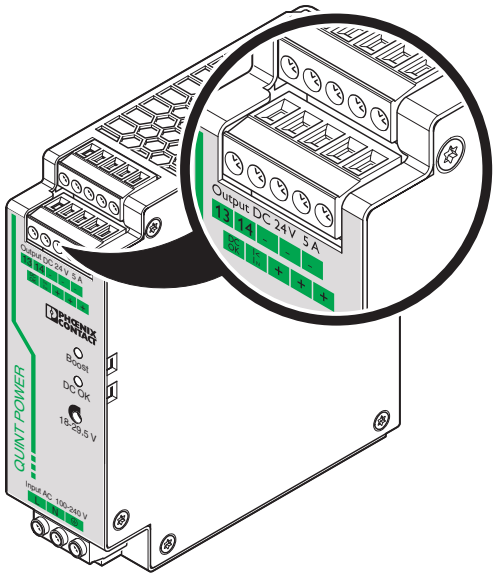
Connect a suitable fuse upstream for DC applications!

CAUTION:

If an internal fuse is triggered, there is a device malfunction. In this case, the device must be inspected in the factory.

8.3 DC output

The output voltage is connected via the “Output DC” connection terminal blocks.

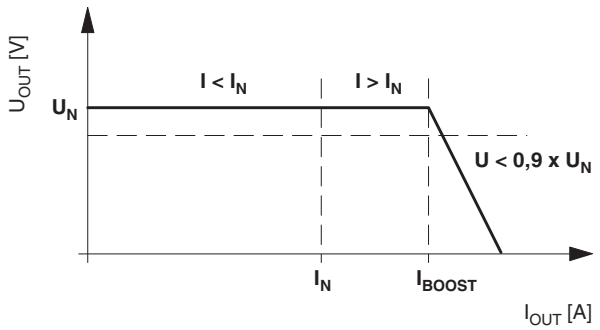


8.3.1 Protection of the secondary side

The device is electronically protected against short-circuit and idling. In the event of a malfunction, the output voltage is limited to 35 V DC.

8.3.2 Output characteristic curve

The module operates according to the U/I characteristic curve with POWER BOOST static power reserve. I_{BOOST} is available with consistent output voltage U_N. High switch-on currents are therefore absorbed without voltage dips.



U_N = 24 V

I_N = 5 A

I_{BOOST} = 7.5 A

SFB technology = 30 A (12 ms)

P_N = 120 W

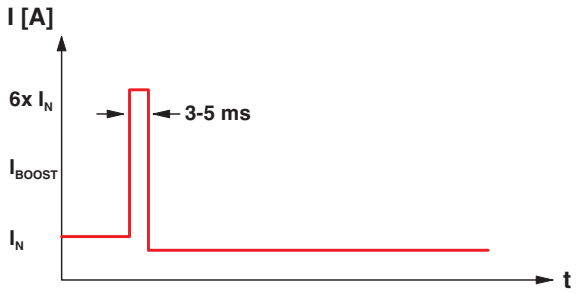
P_{BOOST} = 180 W

9 SFB technology

SFB (Selective Fuse Breaking) technology reliably switches off faulty current paths in the event of a short circuit. In this case, it supplies up to six times the nominal current for 12 ms. SFB technology therefore reliably triggers standard circuit breakers. Faults are located reliably and important system parts remain in operation.

9.1 Circuit breaker tripping characteristics

Typically, a circuit breaker trips within 3 ... 5 ms. Fast enough to avoid voltage drops of parallel connected loads.



Tripping time of the circuit breaker = 3 - 5 ms, typically

9.2 Installation notes

To use the SFB technology of the QUINT power supply, you must observe the following requirements:

– When designing the secondary side, consider the configuration matrix that describes the maximum cable lengths depending on the performance class of the devices, cable cross section, and the circuit breaker.

The current configuration matrix can be found in the product download area.

– Ensure the lowest possible cable impedance at the input of the power supply by using short cable lengths and large cable cross sections.

Note the maximum distance between the power supply and load.

(see also SFB configuration)

9.3 SFB configuration

9.3.1 Standard circuit breakers

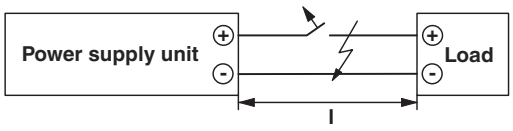


Figure 8 Cable lengths

Maximum distance between the power supply and load (l)

Cross section [^{2}mm]	0.75	1.0	1.5	2.5
Distance l with C2 circuit breaker [m]	5	7	11	19

The following parameters are the basis for calculation:

- Circuit breaker from Siemens, B and C characteristics (e. g., B6: 5SY6106-6)
- B characteristic: electromagnetic tripping of the circuit breaker at the latest at (5-fold rated current) x (correction factor 1.2 at 0 Hz) = 6-fold rated current
- C characteristic: electromagnetic tripping of the circuit breaker at the latest at (10-fold rated current) x (correction factor 1.2 at 0 Hz) = 12-fold rated current
- Ambient temperature: +20 °C
- The internal resistances of the circuit breakers are considered.
- In addition to short circuit current, the relevant power supply unit supplies half of the nominal current for paths connected in parallel.

9.3.2 CB TM1 SFB device circuit breaker

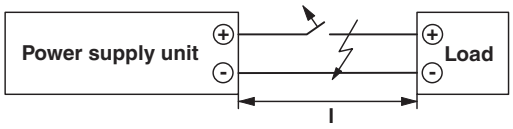


Figure 9 Cable lengths

Maximum distance between the power supply and load (l)

Cross section [^{2}mm]	0.75	1.0	1.5	2.5
Spacing with CB TM1 1A SFB P [m]	27	36	54	91
Spacing with CB TM1 2A SFB P [m]	10	13	20	34

The following parameters are the basis for calculation:

- CB TM1 xA SFB P device circuit breaker
- Electromagnetic triggering of the circuit breaker at the latest at (10 times the rated current)
- Ambient temperature: +20 °C
- The internal resistance of the device circuit breakers is taken into account
- In addition to short circuit current, the relevant power supply unit supplies half of the nominal current for paths connected in parallel.

10 Signaling

The following are available for function monitoring:

– The active signal output DC OK
– The floating DC OK output
– The active POWER BOOST signal output

In addition, the “DC OK” and “BOOST” LEDs can be used to evaluate the function of the power supply directly at the installation location (see output characteristic curve).

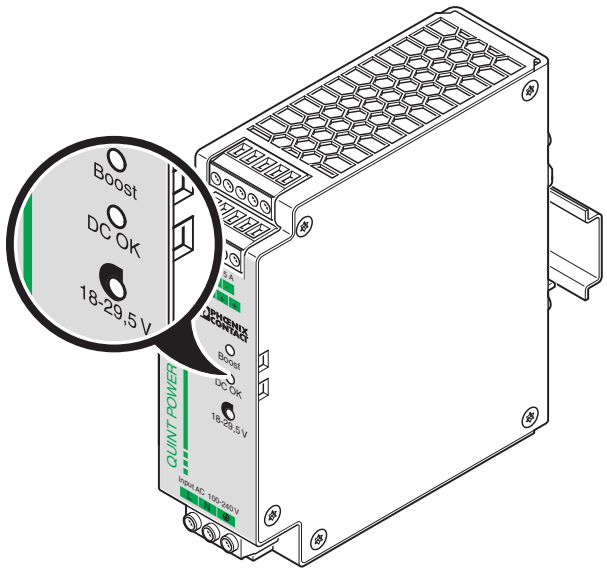


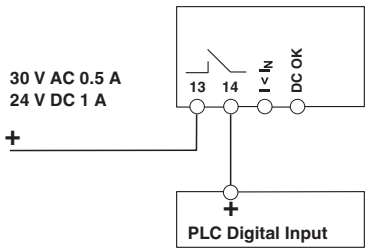
Figure 10 Signal outputs

If the output voltage falls below 90% of the output voltage set on the potentiometer as a result of overloading, the signal state “DC OK” switches from “Active High” to “Low”. The limit value of 90% always refers to the set output voltage range of 18 V DC to 29.5 V DC.

	Normal operation $I < I_N$	POWER BOOST $I > I_N$	Overload mode $U_{OUT} < 0.9 \times U_N$
“DC OK” LED, green	lit	lit	Flashing
“BOOST” LED, yellow	OFF	lit	lit
“DC OK” signal	ON	ON	OFF
“DC OK” relay	closed	closed	opened
Signal “$I < I_N$”	ON	OFF	OFF
Meaning	Normal operation of the power supply unit (U_{OUT} > 21.5 V)	POWER BOOST mode, e.g., for starting loads	Overload mode, e. g., load short circuit or overload

10.1 Floating switch contact

The floating switch contact opens to indicate that the set output voltage has been undershot by more than 10 % ($U_{OUT} < 0.9 \times U_N$). Signals and ohmic loads can be switched. For heavily inductive loads such as a relay, a suitable protective circuit (e.g., freewheeling diode) is necessary.



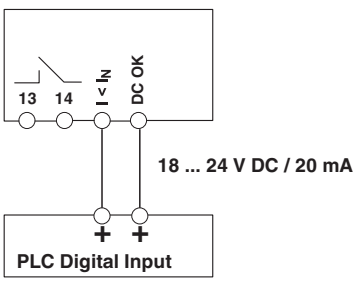
10.2 Active signal outputs

For the transmission of signals to a higher-level controller, the active “DC OK” and “Boost” signal outputs can be used.

The 18 ... 24 V DC signal is applied between the “DC OK” and “-” (active DC OK signal output) or between “$I < I_N$” and “-” (active POWER BOOST signal output) and can withstand a maximum of 20 mA.

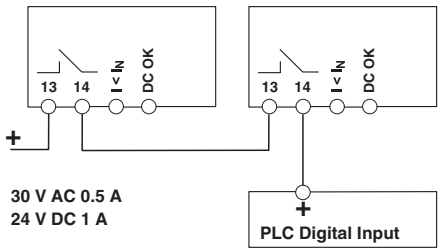
By switching from “active high” to “low”, the DC OK signal output indicates that the set output voltage has been undershot by more than 10 % ($U_{OUT} < 0.9 \times U_N$). The DC OK signal is decoupled from the power output. This makes it impossible for devices connected in parallel to act as an external power supply.

The BOOST signal output “$I < I_N$” indicates that the nominal current has been exceeded. The power supply then switches to POWER BOOST mode. Thanks to this preventive function monitoring, critical operating states can be recognized at an early stage, prior to a voltage dip occurring.



10.3 Signal loop

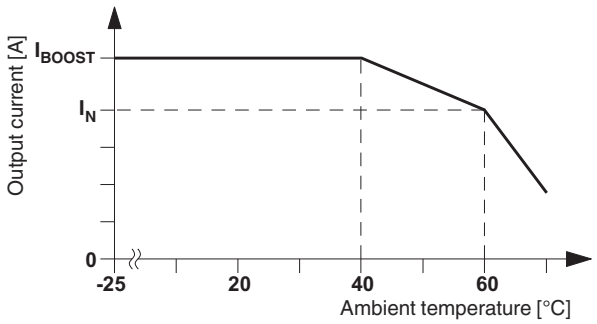
Monitoring of two devices: use the active DC OK signal output of device 1 and loop the floating alarm output of device 2. In the event of a malfunction, you will receive a group error message. Any number of devices can be looped. This signal combination saves wiring costs and logic inputs.



11 Derating

11.1 Temperature-dependent derating

At an ambient temperature of -25 °C to +40 °C, the device continuously supplies the I_{BOOST} output current. The device can supply the I_N nominal output current up to an ambient temperature of +60°C. At ambient temperatures above +60 °C, the output power must be decreased by 2.5 % per Kelvin increase in temperature. At ambient temperatures above +70 °C or in the event of a thermal overload, the device does not switch off. The output power is decreased to such an extent that device protection is provided. Once the device has cooled down, the output power is increased again.



12 Operating modes

12.1 Series operation

Two power supplies can be connected in series to double the voltage. Only devices of the same performance class should be connected in series. Series connection should always be used when the output voltage of the module is not sufficient. For example, power supplies with 24 V DC nominal output voltage each supply 48 V DC in series. Depending on the specification of the PE connection, output voltages of +48 V or -48 V as well as ±24 V DC can also be made available.

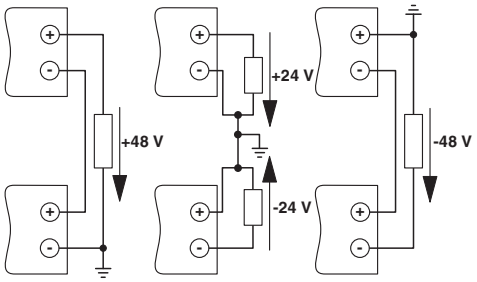


Figure 11 Series operation

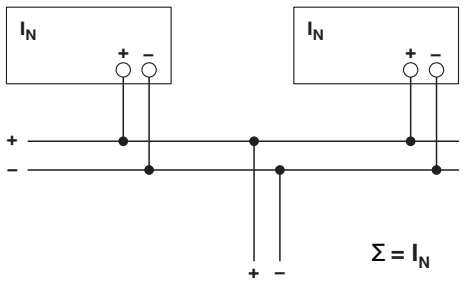
12.2 Parallel operation

Devices of the same type can be connected in parallel to increase both redundancy and power. No further adjustments are necessary for the default setting.

If the output voltage of a power supply unit is adjusted, all power supplies connected in parallel must be set to the same output voltage in order to ensure an even distribution of current.

In order to ensure symmetrical current distribution, we recommend that all cable connections from the power supply unit to the busbar are the same length and have the same cross section.

Depending on the system, a protective circuit should be installed at each individual device output (e.g., decoupling diode, DC fuse or circuit breaker) for parallel connection of more than two power supplies. This prevents high return currents in the event of a secondary device fault.

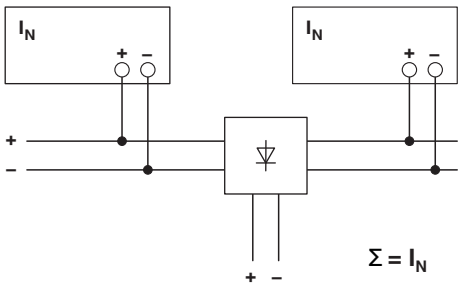


12.3 Redundant operation

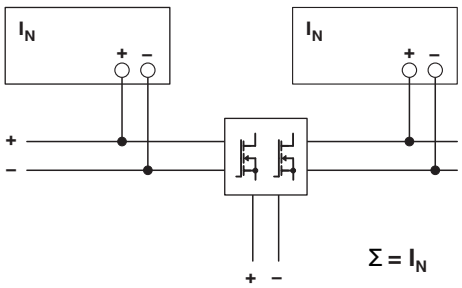
Redundant circuits are suitable for supplying systems which place particularly high demands on operational safety. If a 1+1 redundancy is implemented, this means that for a load of 20 A, two modules each with 20 A must be connected in parallel on the output side. In the event of an internal device fault or failure of the mains power supply on the primary side, the second module automatically takes over the entire supply of the loads.

Optimization of redundancy can be achieved by decoupling and monitoring. Phoenix Contact offers a comprehensive product range for this purpose (e. g., QUINT-DIODE or QUINT-ORING).

Example: diode module

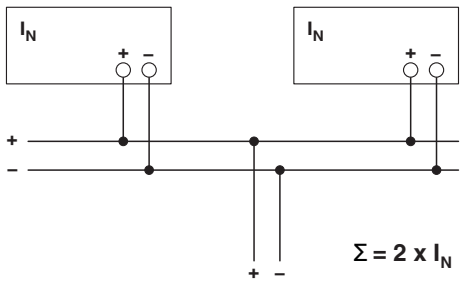


Example: QUINT ORING



12.4 Increasing power

The output current can be increased to n x I_N in the case of n parallel connected devices. Parallel connection for increasing power is used when extending existing systems. A parallel connection is recommended if the power supply unit does not cover the current consumption of the most powerful load. Otherwise, the load should be distributed between individual devices that are independent from one another.



FF12A230UF

standard with fan

> CONTACT US

FF series exhaust filter and filter fans represents a side-mounted cooling solution with filtered ambient air to maintain optimum ventilation inside the electrical cabinets. Screwless connection, fast tool-free mounting system with clip and maintenance friendliness are the main benefits. Available in a wide range of configurations for both indoor and outdoor use.

Technical data		
APPROVALS		
Approvals	CE; cURus; cULus; cCSAus; UKCA	
PERFORMANCE		
Max Airflow	45/50 26/29	m³/h CFM
Airflow with Exhaust Filter	29/34 17/20	m³/h CFM
Max Static Pressure	55/62 0.22/0.25	Pa in H2O
ELECTRICAL DATA		
Rated Voltage	230	V a.c.
Rated Current	0.11/0.1	A
Rated Power	18/17	W
Operating Voltage	216-244	V a.c.
Frequency	50/60	Hz
Appliance Class	I	
Motor Protection	Impedance Protected	
MECHANICAL DATA		
Mounting Wall Thickness	1.3-3.2 0.05-0.13	mm in
GENERIC DATA		
Spare Parts Filter Media	M12FPF-EU3	

FF12A230UF | standard with fan

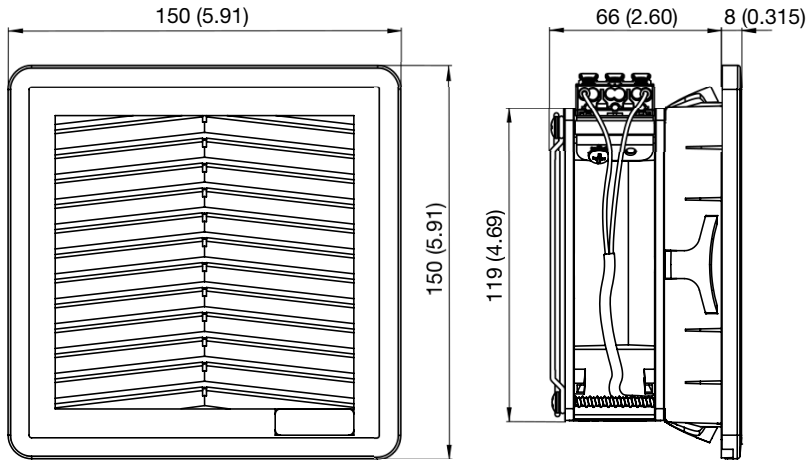
> CONTACT US

Technical data		
Casing Material	PC/ABS UL94 V-0	
RAL Number	7035	
Airflow Direction	Direct	
Electrical Connection	Screwless Terminal Block	
Life Expectancy	57000 57000	h at 25 °C h at 77 °F
Wires Section	0.75-2.5	mm²
Wires Section	20-14	AWG
Fan Noise	46/49	dB(A)
Filter Class	G3	EN 779
Filter Class	ISO coarse 55%	ISO 16890
Filter Material	thermo-linked progressive structure synthetic fibre	
ENVIRONMENTAL AND THERMAL DATA		
IP Protection Degree	IP54	
Operating Temperature	-10÷55 14÷131	°C °F
Storage Temperature	-40÷70 -40÷158	°C °F
UL DATA		
UL File Number Recognized Component	E237844	
UL File Number Listed	E500932	
UL Environmental Type Rating	Type 12	
UL Ambient Temperature	55 131	°C °F

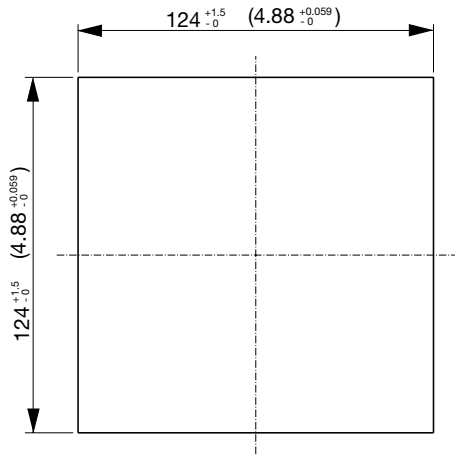
FF12A230UF | standard with fan

> CONTACT US

Technical drawing mm (in)



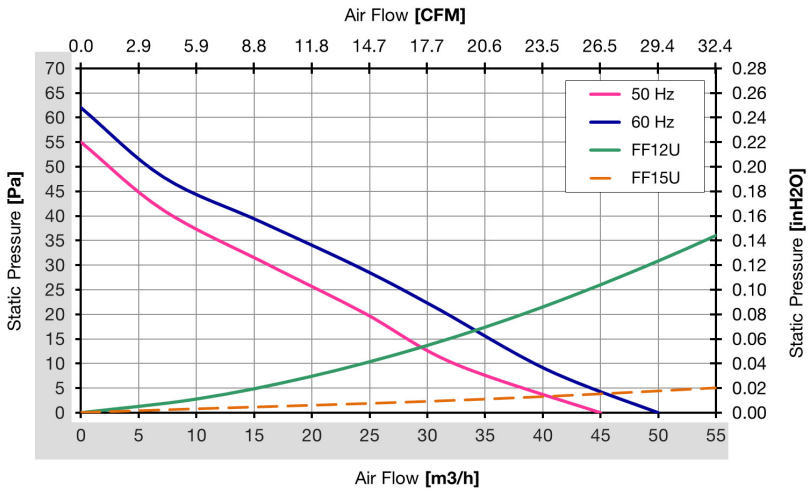
Mounting cut-out mm (in)



FF12A230UF | standard with fan

> CONTACT US

Air performance



MTL4544D – MTL5544D
REPEATER POWER SUPPLY

single channel, 4/20mA, HART®
for 2- or 3-wire transmitters, two outputs

The MTLx544D provides a fully-floating dc supply for energising a conventional 2- or 3-wire 4/20mA transmitter located in a hazardous area, and repeats the current in other circuits to drive two safe-area loads. For HART 2-wire transmitters, the unit allows bi-directional transmission of digital communication signals superimposed on the 4/20mA loop current. Separately powered current sources, such as 4-wire transmitters, can be connected but will not support HART communication.

SPECIFICATION

See also common specification

Number of channels
One

Location of transmitter
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div. 1, Group A hazardous location

Safe-area output

Signal range:	4 to 20mA
Under/over-range:	0 to 24mA
Safe-area load resistance	
@ 24mA:	0 to 360Ω
@ 20mA:	0 to 450Ω
Safe-area circuit output resistance:	> 1MΩ

Safe-area circuit ripple
< 50µA peak-to-peak

Hazardous-area input

Signal range:	0 to 24mA (including over-range)
Transmitter voltage:	16.5V at 20mA

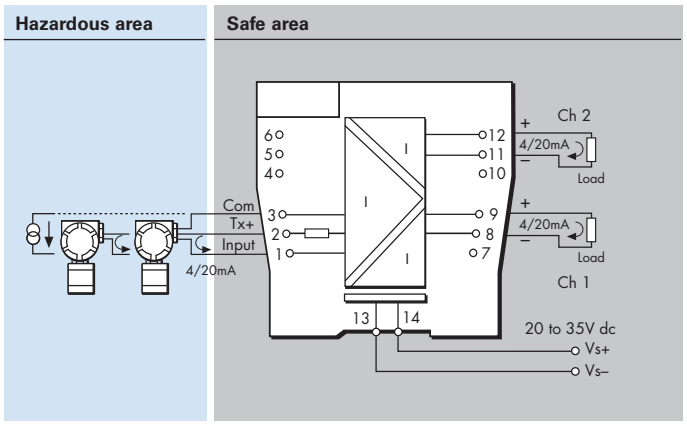
Transfer accuracy at 20°C
Better than 15µA

Temperature drift
< 0.8µA/°C

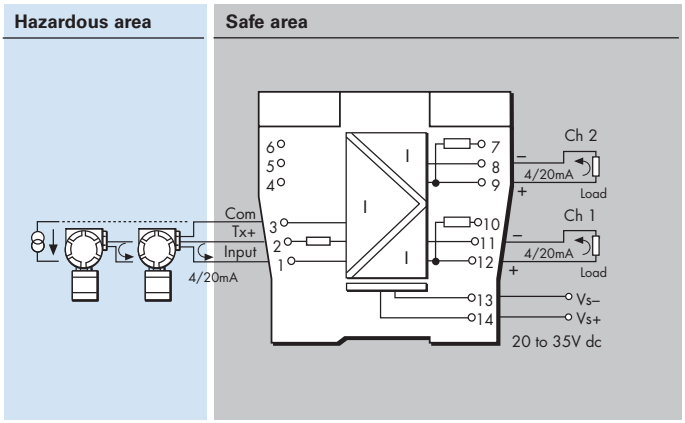
Response time
Settles to within 10% of final value within 50µs

Communications supported
HART (terminals 1 & 2, output Ch 1 only)

MTL4544D



MTL5544D



LED indicator
Green: power indication

Maximum current consumption (with 20mA signals)
96mA at 24V dc

Power dissipation within unit (with 20mA signals)
1.4W @ 24V dc

Safety description
Terminals 2 to 1 and 3:
U_o=28V I_o=93mA P_o=651mW U_m = 253V rms or dc
Terminals 1 to 3:
Simple apparatus ≤1.5V, ≤0.1A and ≤25mW; can be connected without further certification into any IS loop with an open-circuit voltage <28V

SIL capable
These models have been assessed for use in IEC 61508 functional safety applications.
SIL2 capable for a single device (HFT=0)
SIL3 capable for multiple devices in safety redundant configurations (HFT=1)
See data on MTL web site and refer to the safety manual.

Powering Business Worldwide

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MTL4544/S – MTL5544/S REPEATER POWER SUPPLY

2-channel, 4/20mA, HART®, 2- or 3- wire transmitters

The MTLx544 provides fully-floating dc supplies for energising two conventional 2-wire or 3-wire 4/20mA or HART transmitters located in a hazardous area, and repeats the current in other circuits to drive two safe-area loads. For smart transmitters, the unit allows bi-directional transmission of digital communication signals superimposed on the 4/20mA loop current. Alternatively, the MTLx544S acts as a current sink for a safe-area connection rather than driving a current into the load. Separately powered current sources, such as 4-wire transmitters, can be connected but will not support HART communication.

SPECIFICATION

See also common specification

Number of channels
Two

Location of transmitter
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div. 1, Group A hazardous location

Safe-area output

Signal range:	4 to 20mA
Under/over-range:	0 to 24mA
Safe-area load resistance (MTLx 544)	
@ 24mA:	0 to 360Ω
@ 20mA:	0 to 450Ω
Safe-area load (MTLx544S)	
Current sink:	600Ω max.
Maximum voltage source:	24V dc
Safe-area circuit output resistance:	> 1MΩ

Safe-area circuit ripple
< 50µA peak-to-peak

Hazardous-area input

Signal range:	0 to 24mA (including over-range)
Transmitter voltage:	16.5V at 20mA

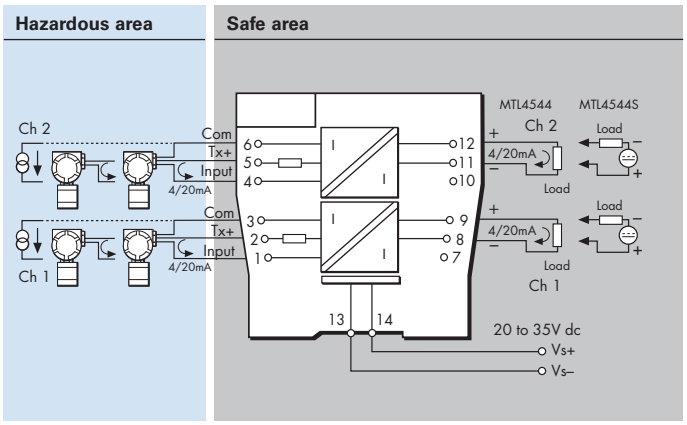
Transfer accuracy at 20°C
Better than 15µA

Temperature drift
< 0.8µA/°C

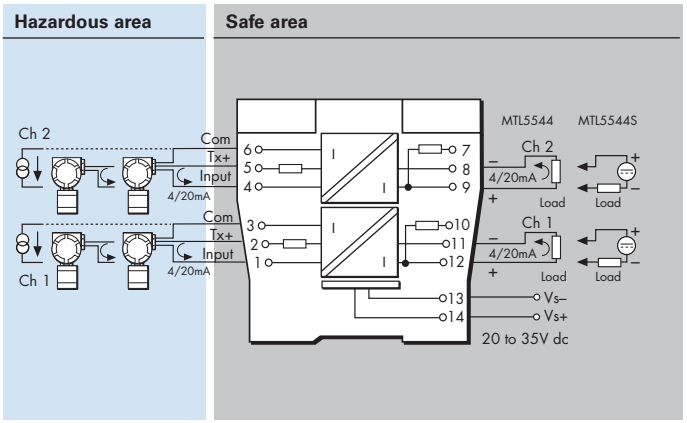
Response time
Settles to within 10% of final value within 50µs

Communications supported
HART (terminals 1 & 2 and 4 & 5 only)

MTL4544 / MTL4544S



MTL5544 / MTL5544S



LED indicator
Green: power indication

Maximum current consumption (with 20mA signals)
96mA at 24V dc

Power dissipation within unit (with 20mA signals)

MTLx544	1.4W @ 24V dc
MTLx544S	1.9W @ 24V dc

Safety description (each channel)
Terminals 2 to 1 and 3, and 5 to 4 and 6:
U_o=28V I_o=93mA P_o=651mW U_m = 253V rms or dc
Terminals 1 to 3 and 4 to 6:
Simple apparatus ≤1.5V, ≤0.1A and ≤25mW; can be connected without further certification into any IS loop with an open-circuit voltage <28V

SIL capable
These models have been assessed for use in IEC 61508 functional safety applications.
SIL2 capable for a single device (HFT=0)
SIL3 capable for multiple devices in safety redundant configurations (HFT=1)
See data on MTL web site and refer to the safety manual.

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MTL4546/C/Y – MTL5546/Y ISOLATING DRIVER

for 4–20mA HART® valve positioners with line fault detection

The MTLx546 accepts a 4/20mA floating signal from a safe-area controller to drive a current/pressure converter (or any other load up to 800Ω) in a hazardous area. For HART valve positioners, the module also permits bi-directional transmission of digital communication signals. Process controllers with a readback facility can detect open or short circuits in the field wiring: if these occur, the current taken into the terminals drops to a preset level. The MTL4546C and the MTLx546Y are very similar to the MTLx546 except that they provide open circuit detection only (i.e. no short-circuit detection).

SPECIFICATION

See also common specification

Number of channels
One

Location of I/P converter
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div. 1, Group A, hazardous location

Working range
4 to 20mA

Digital signal bandwidth
500Hz to 10kHz

Maximum load resistance
800Ω (16V at 20mA)

Minimum load resistance
90Ω (short-circuit detection at < 50Ω)

Output resistance
> 1MΩ

Under/over range capability
Under range = 1mA
Over range = 24mA (load ≤ 520Ω)

Input and output circuit ripple
< 40µA peak-to-peak

Transfer accuracy at 20°C
Better than 20µA

Temperature drift
< 1.0µA/°C

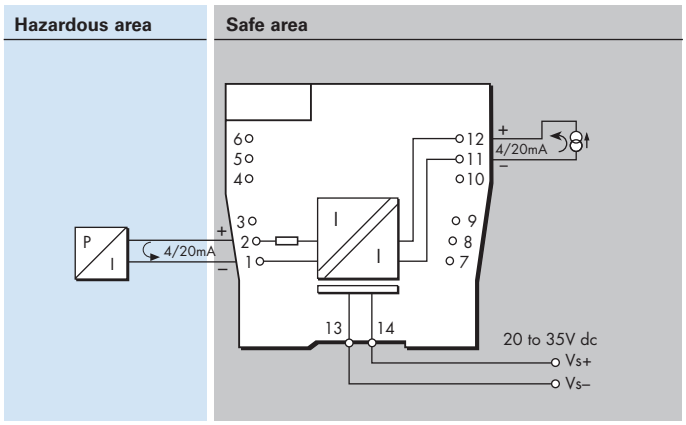
Input characteristics

Field wiring state	MTLx546	MTL4546C	MTLx546Y
Normal	< 6.0V	< 6.0V	< 6.0V
Open-circuit	< 0.9mA	< 0.9mA	< 0.5mA
Short-circuit	< 0.9mA	N.A.	N.A.

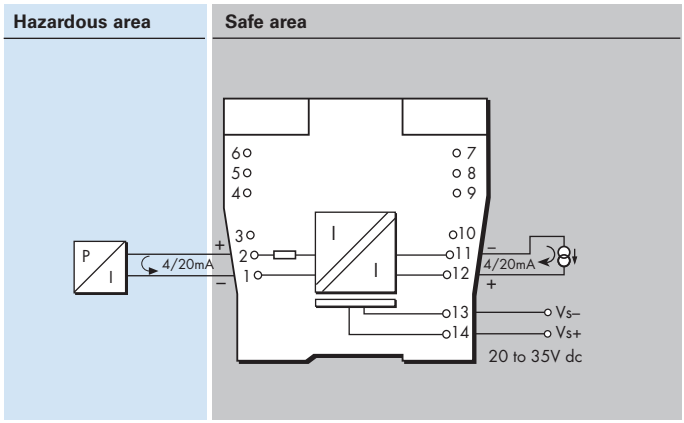
Response time
Settles within 200µA of final value within 100ms

Communications supported
HART

MTL4546 / MTL4546C / MTL4546Y



MTL5546 / MTL5546Y



LED indicator
Green: power indication

Maximum current consumption (with 20mA signals into 250Ω load)
35mA at 24V dc

Power dissipation within unit (with 20mA signals into 250Ω load)
0.8W at 24V

Safety description
U_o=28V I_o=93mA P_o=651mW U_m = 253V rms or dc

SIL capable
These models have been assessed for use in IEC 61508 functional safety applications.
SIL2 capable for a single device (HFT=0)
SIL3 capable for multiple devices in safety redundant configurations (HFT=1)
See data on MTL web site and refer to the safety manual.

Powering Business Worldwide

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PLC-RSC- 24DC/21 - Relay Module

2966171

https://www.phoenixcontact.com/us/products/2966171

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PLC-INTERFACE, consisting of basic terminal block PLC-BSC.../21 with screw connection and plug-in miniature relay with power contact, for assembly on DIN rail NS 35/7,5, 1 changeover contact, input voltage 24 V DC

Your advantages

- Slim design
- Efficient connection to system cabling using V8 adapter
- RT III sealed relay
- Safe isolation between coil and contact side
- Functional plug-in bridges
- Integrated input circuit and interference suppression circuit

Commercial data

Item number	2966171
Packing unit	10 pc
Minimum order quantity	10 pc
Sales key	C462
Product key	CK6226
Catalog page	Page 364 (C-5-2019)
GTIN	4017918130732
Weight per piece (including packing)	39.8 g
Weight per piece (excluding packing)	31.06 g
Customs tariff number	85364190
Country of origin	DE

Technical data

Notes

Notes on operation	Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....

Product properties

Product type	Relay Module
Product family	PLC-INTERFACE
Application	Universal
Operating mode	100% operating factor
Mechanical service life	2x 10^7 cycles

Data management status

Date of last data management	27.06.2024

Electrical properties

Maximum power dissipation for nominal condition	0.22 W
Test voltage (Winding/contact)	4 kV AC (50 Hz, 1 min., winding/contact)

Insulation characteristics: Coil/contact

Rated insulation voltage	250 V
Rated impulse withstand voltage	6 kV
Overvoltage category	III
Degree of pollution	3

Input data

Coil side

Nominal input voltage U_N	24 V DC
Input voltage range	18.5 V DC ... 33.6 V DC (20 °C)
Nominal voltage (plugged-in electromechanical relay)	24 V DC
Drive and function	monostable
Drive (polarity)	polarized
Typical input current at U_N	9 mA
Typical response time	5 ms
Typical release time	8 ms
Protective circuit	Reverse polarity protection; Polarity protection diode
	Freewheeling diode; Freewheeling diode
Operating voltage display	Yellow LED

Output data

Switching

Contact switching type	1 changeover contact
Type of switch contact	Single contact
Contact connection type	Power contact
Contact material	AgSnO
Maximum switching voltage	250 V AC/DC (The separating plate PLC-ATP should be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or ...FBST 500...)
Minimum switching voltage	5 V (100 mA)
Limiting continuous current	6 A
Maximum inrush current	10 A (4 s)
Min. switching current	10 mA (12 V)
Short-circuit current	200 A (conditional short-circuit current)
Interrupting rating (ohmic load) max.	140 W (at 24 V DC)
	20 W (at 48 V DC)
	18 W (at 60 V DC)
	23 W (at 110 V DC)
	40 W (at 220 V DC)
	1500 VA (for 250 V AC)
Output fuse	4 A gL/gG NEOZED
Switching capacity	2 A (at 24 V, DC13)
	0.2 A (at 110 V, DC13)
	0.1 A (at 220 V, DC13)
	3 A (at 24 V, AC15)
	3 A (at 120 V, AC15)
	3 A (at 230 V, AC15)

Connection data

Connection method	Screw connection
Stripping length	8 mm
Screw thread	M3
Conductor cross section rigid	0.14 mm² ... 2.5 mm²
Conductor cross section flexible	0.14 mm² ... 2.5 mm²
	0.2 mm² ... 2.5 mm² (Single ferrule)
	2x 0.5 mm² ... 1.5 mm² (TWIN ferrule)
Conductor cross section AWG	26 ... 14
Tightening torque	0.6 Nm ... 0.8 Nm
	5 lb_f-in. ... 7 lb_f-in.

Dimensions

Width	6.2 mm
Height	80 mm
Depth	94 mm

Material specifications

Color	gray (RAL 7042)
Flammability rating according to UL 94	V0 (Housing)

Environmental and real-life conditions

Ambient conditions

Degree of protection (Relay)	RT III (Relay)
Degree of protection (Relay base)	IP20 (Relay base)
Degree of protection (Installation location)	≥ IP54 (Installation location)
Ambient temperature (operation)	-40 °C ... 70 °C (see to derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C

Approvals

CE

Certificate	CE-compliant

UKCA

Certificate	UKCA-compliant

Shipbuilding approval

Certificate	TAE0000196

Corrosive gas test

Identification	ISA-S71.04. G3 Harsh Group
	EN 60068-2-60

UL data

Ambient temperature (operation)	-40 °F ... 158 °F
Note	Use copper cables approved for at least 75 °C.

DNV GL data

Temperature	D
Humidity	A
Vibration	B/C
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

EMC data

Low Voltage Directive	Conformance with Low Voltage Directive
Electromagnetic compatibility	Conformance with EMC directive

Standards and regulations

Standards/regulations	IEC 60947-5-1

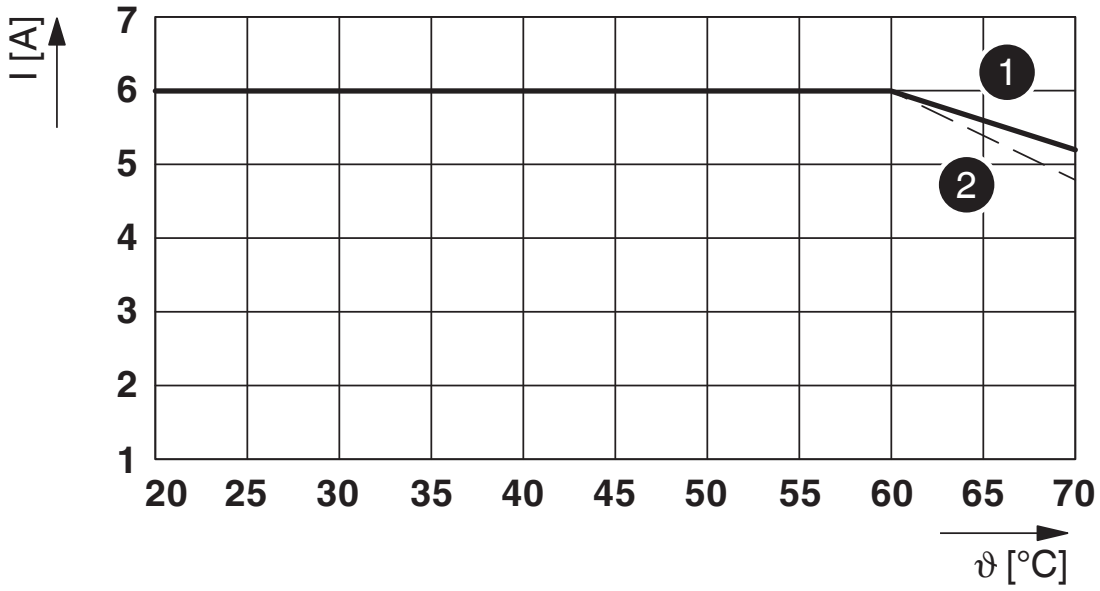
Mounting

Mounting type	DIN rail mounting

Assembly note	in rows with zero spacing
Mounting position	any

Drawings

Diagram

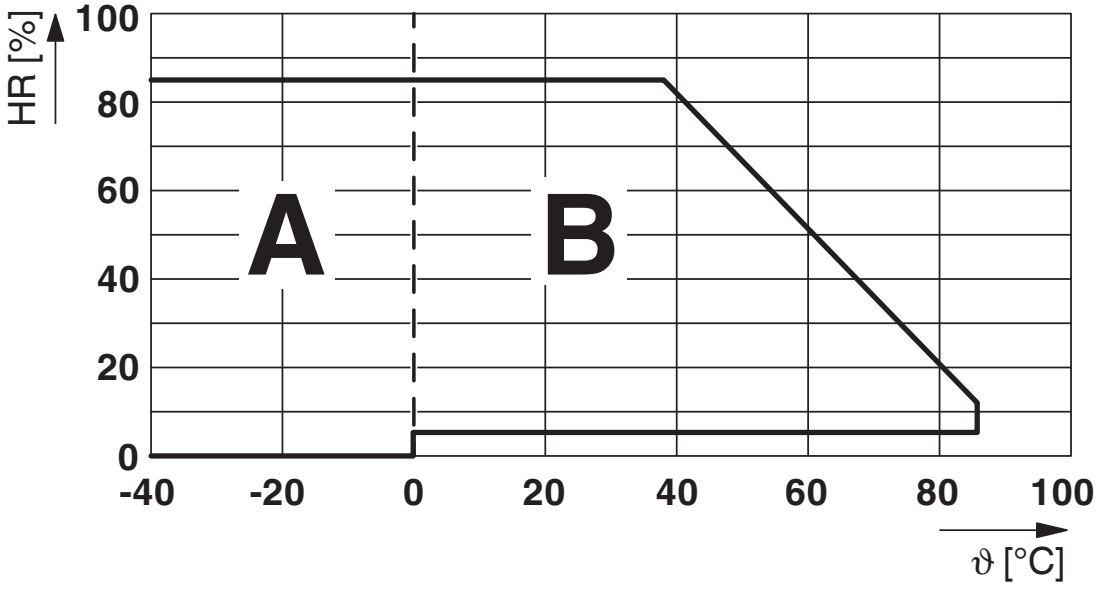


Limiting continuous current per contact for 0.85 ... 1.1 U_N (contact-side)

(1) Limiting continuous current for horizontal installation position without clearance

(2) Limiting continuous current for vertical installation position without clearance

Diagram

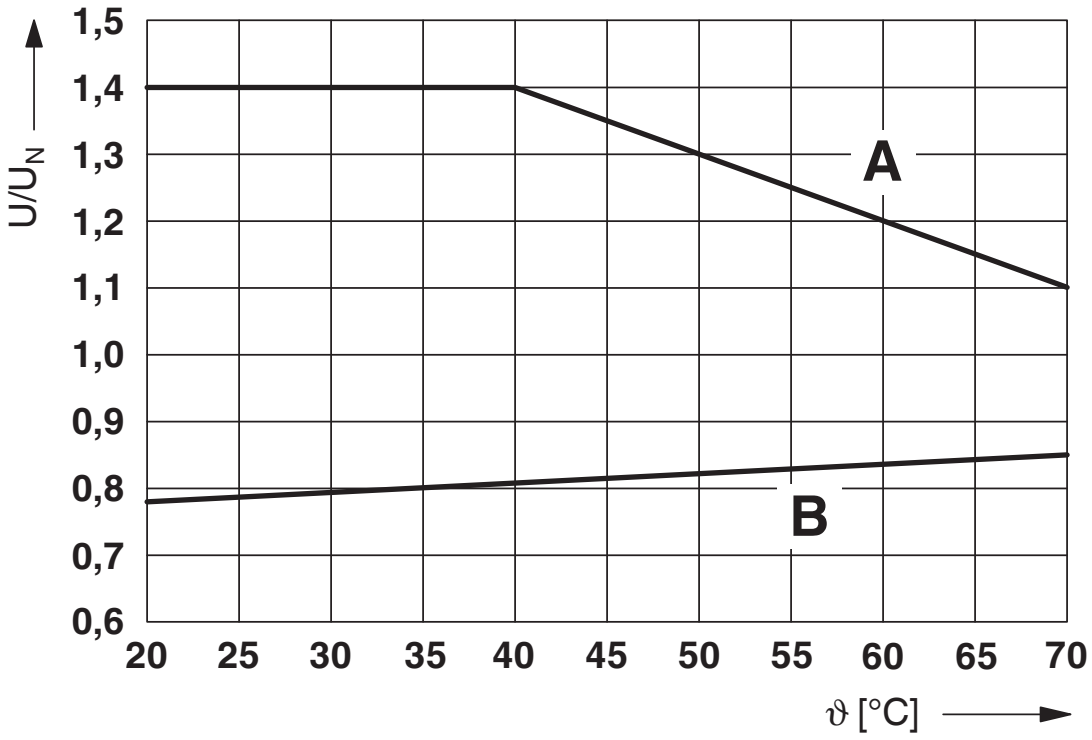


Permissible humidity for operation and storage.
The maximum permissible ambient temperature as specified in the data sheet must be observed.

Area A: Ice buildup at ambient temperatures ≤ 0°C must be prevented
Area B: Condensation at ambient temperatures > 0°C must be prevented

On 30 full days that are naturally distributed across an entire year, a humidity level of 95% is permissible at an ambient temperature ≤ 25°C.

Diagram



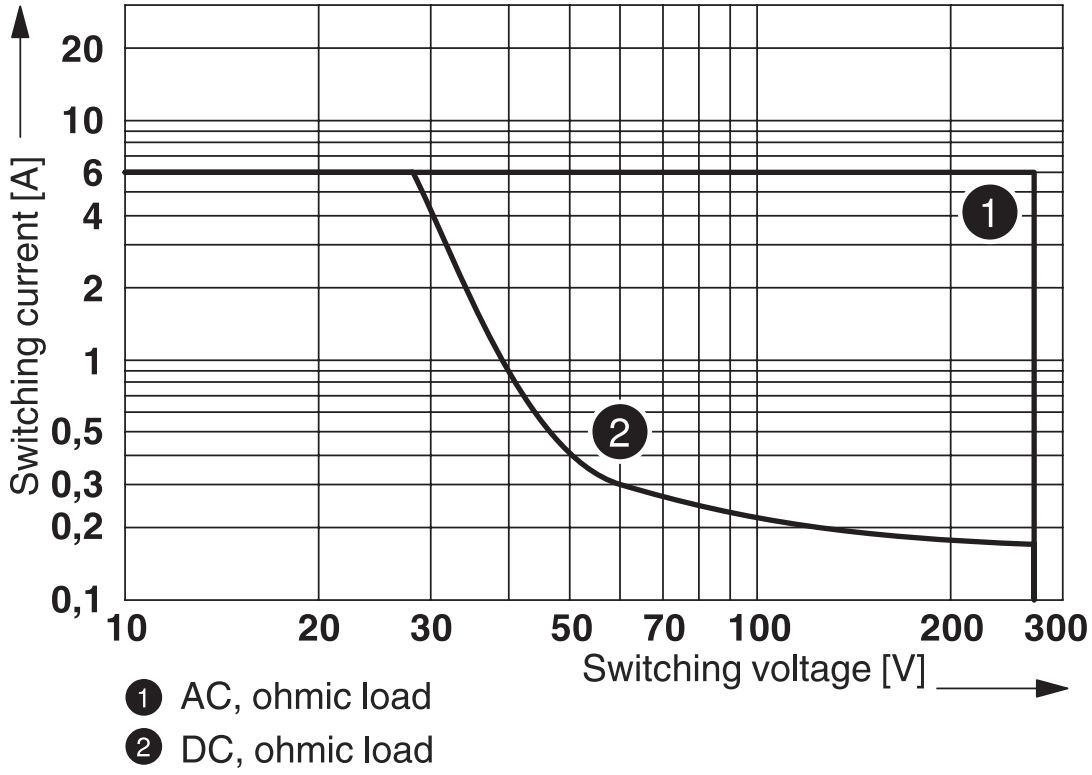
Curve A

Maximum permissible continuous voltage U_{max} with limiting continuous current on the contact side (see relevant technical data)

Curve B

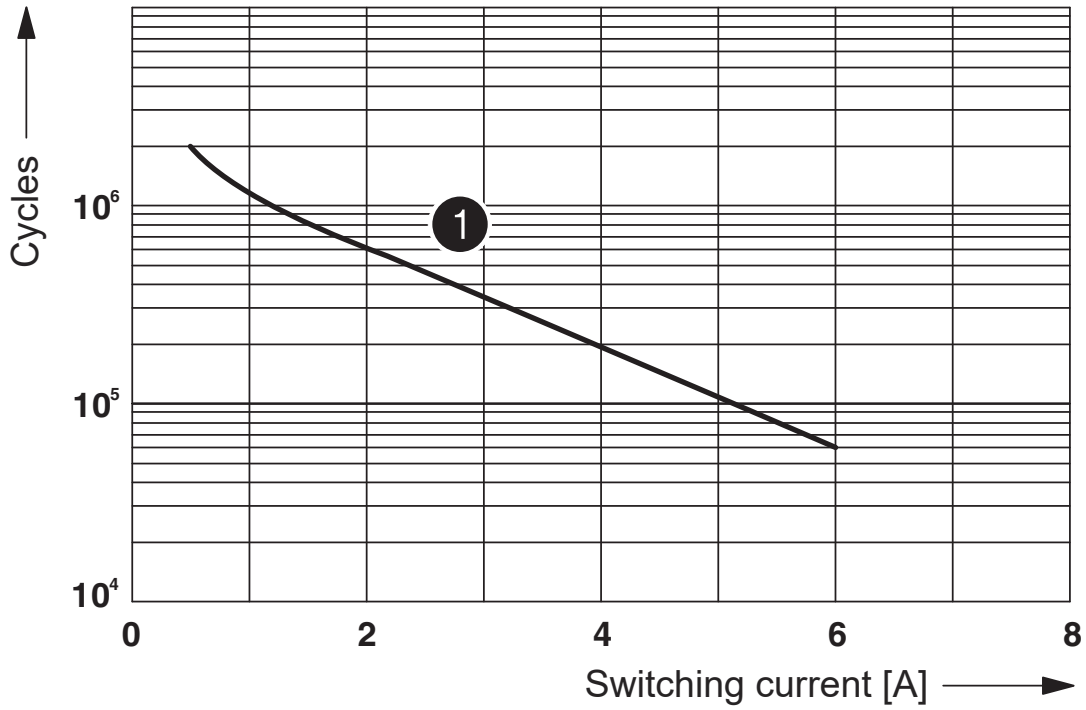
Minimum permissible operate voltage U_{op} after pre-excitation (see relevant technical data)

Diagram



Interrupting rating

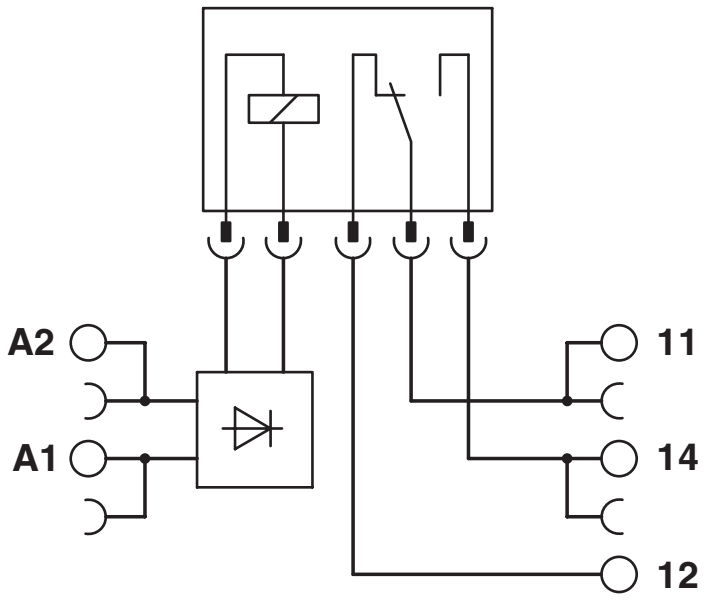
Diagram



1 250 V AC, ohmic load

Electrical service life

Circuit diagram



Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2966171

cUL Recognized
Approval ID: FILE E 238705

UL Recognized
Approval ID: FILE E 238705

EAC
Approval ID: TR_TS_D_00573_c

DNV GL
Approval ID: TAE0000196

EAC
Approval ID: RU*C-DE.*08.B.00010

UL Listed
Approval ID: FILE E 172140

cUL Listed
Approval ID: FILE E 172140

cULus Listed
Approval ID: E140324

cULus Recognized

cULus Listed

Classifications

ECLASS

ECLASS-11.0	27371601
ECLASS-12.0	27371601
ECLASS-13.0	27371601

ETIM

ETIM 9.0	EC001437

UNSPSC

UNSPSC 21.0	39122300

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Hexahydromethylphthalic anhydride(CAS: n/a)
	Lead(CAS: 7439-92-1)
SCIP	20094ffa-eb95-4291-a21b-4463d52fab42

EF3.0 Climate Change

CO2e kg	0.335 kg CO2e

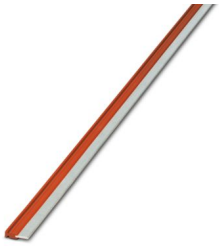
Accessories

Note: Applying some accessories below might limit this product.

FBST 500-PLC RD - Continuous plug-in bridge

2966786

https://www.phoenixcontact.com/us/products/2966786



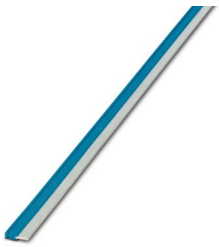
Continuous plug-in bridge, length: 500 mm, color: red

Max. current carrying capacity: 32 A

FBST 500-PLC BU - Continuous plug-in bridge

2966692

https://www.phoenixcontact.com/us/products/2966692



Continuous plug-in bridge, length: 500 mm, color: blue

Max. current carrying capacity: 32 A

FBST 500-PLC GY - Continuous plug-in bridge

2966838

https://www.phoenixcontact.com/us/products/2966838

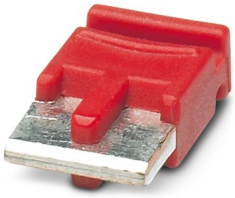
Continuous plug-in bridge, length: 500 mm, color: gray

Max. current carrying capacity: 32 A

FBST 6-PLC RD - Single plug-in bridge

2966236

https://www.phoenixcontact.com/us/products/2966236



Single plug-in bridge, number of positions: 2, length: 6 mm, color: red

Max. current carrying capacity: 6 A

FBST 6-PLC BU - Single plug-in bridge

2966812

https://www.phoenixcontact.com/us/products/2966812

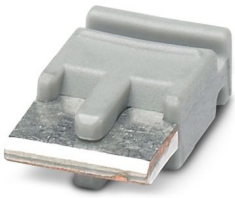
Single plug-in bridge, number of positions: 2, length: 6 mm, color: blue

Max. current carrying capacity: 6 A

FBST 6-PLC GY - Single plug-in bridge

2966825

https://www.phoenixcontact.com/us/products/2966825



Single plug-in bridge, number of positions: 2, length: 6 mm, color: gray

Max. current carrying capacity: 6 A

FBST 8-PLC GY - Single plug-in bridge

2967688

https://www.phoenixcontact.com/us/products/2967688

Single plug-in bridge, number of positions: 2, length: 8 mm, color: gray

Max. current carrying capacity: 6 A

PLC-V8/FLK14/OUT - System connection

2295554

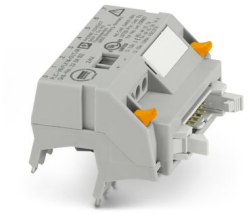
https://www.phoenixcontact.com/us/products/2295554

V8 adapter for 8 x PLC-INTERFACE (6.2 mm), controller: PLC system cabling of output cards, connection 1: IDC/FLK pin strip 1x 14-position, connection 2: Plug-in connection (Can be snapped onto 8x PLC-INTERFACE terminals), connection 3: Screw connection 1x 2-position, number of channels: 8, control logic: positive switching

PLC-V8/FLK14/OUT/M - System connection

2304102

https://www.phoenixcontact.com/us/products/2304102

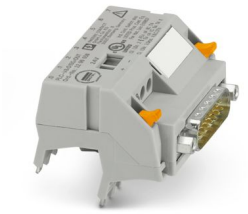


V8 adapter for 8 x PLC-INTERFACE (6.2 mm), controller: PLC system cabling of output cards, connection 1: IDC/FLK pin strip 1x 14-position, connection 2: Plug-in connection (Can be snapped onto 8x PLC-INTERFACE terminals), connection 3: Screw connection 1x 2-position, number of channels: 8, control logic: minusschaltend

PLC-V8/D15S/OUT - System connection

2296058

https://www.phoenixcontact.com/us/products/2296058

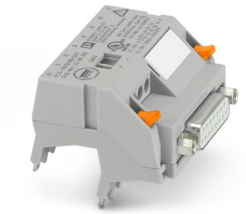


V8 adapter for 8 x PLC-INTERFACE (6.2 mm), controller: PLC system cabling of output cards, connection 1: D-SUB pin strip 1x 15-position, connection 2: Plug-in connection (Can be snapped onto 8x PLC-INTERFACE terminals), connection 3: Screw connection 1x 2-position, number of channels: 8, control logic: positive switching

PLC-V8/D15B/OUT - System connection

2296061

https://www.phoenixcontact.com/us/products/2296061



V8 adapter for 8 x PLC-INTERFACE (6.2 mm), controller: PLC system cabling of output cards, connection 1: D-SUB socket strip 1x 15-position, connection 2: Plug-in connection (Can be snapped onto 8x PLC-INTERFACE terminals), connection 3: Screw connection 1x 2-position, number of channels: 8, control logic: positive switching

PLC-FA-5X20 - Fuse adapter

1186510

https://www.phoenixcontact.com/us/products/1186510

Safety plug adapter for use on a 6.2 mm PLC basic terminal block. For 5 x 20 mm fuses. Operating voltage: Universal. Without fuse failure indication.

PLC-FA-I-5X20-12-24UC - Fuse adapter

1186499

https://www.phoenixcontact.com/us/products/1186499

Safety plug adapter for use on a 6.2 mm PLC basic terminal block. For 5 x 20 mm fuses. Operating voltage: 12 ... 24 V AC/DC. With LED for fuse failure indication.

PLC-FA-I-5X20-120-230UC - Fuse adapter

1186508

https://www.phoenixcontact.com/us/products/1186508

Safety plug adapter for use on a 6.2 mm PLC basic terminal block. For 5 x 20 mm fuses. Operating voltage: 120 ... 230 V AC/DC. With LED for fuse failure indication.

PLC-V8C/PT-24DC/RS485 - Controller

1452919

https://www.phoenixcontact.com/us/products/1452919

PLC logic basic module with RS-485 connection for Modbus/RTU communication, with 16 I/Os, for plug-in connection to 8 digital or analog PLC-INTERFACE terminal blocks, can be extended to 48 I/Os, real-time clock, micro USB female connector, accommodates memory module and Bluetooth adapter, Push-in connection

PLC-V8C/SC-24DC/EM - Extension module

2903095

https://www.phoenixcontact.com/us/products/2903095

PLC logic extension module with 16 I/Os, for plug-in connection to eight PLC-INTERFACE terminal blocks for extending the basic module (a maximum of two extension modules can be connected to a basic module), screw connection

PLC-V8C/PT-24DC/EM - Extension module

2905137

https://www.phoenixcontact.com/us/products/2905137

PLC logic extension module with 16 I/Os, for plug-in connection to eight PLC-INTERFACE terminal blocks for extending the basic module (a maximum of two extension modules can be connected to a basic module), Push-in connection

PLC-V8C/PT-24DC/SAM2 - Controller

2907443

https://www.phoenixcontact.com/us/products/2907443

PLC logic stand-alone module, Generation 2, with 16 I/Os, for plug-in connection to eight digital or analog PLC-INTERFACE terminal blocks, cannot be extended, real-time clock, micro USB female connector, accommodates memory module and Bluetooth adapter, Push-in connection

PLC-V8C/SC-24DC/SAM2 - Controller

2907445

https://www.phoenixcontact.com/us/products/2907445

PLC logic stand-alone module, Generation 2, with 16 I/Os, for plug-in connection to eight digital or analog PLC-INTERFACE terminal blocks, cannot be extended, real-time clock, micro USB female connector, accommodates memory module and Bluetooth adapter, screw connection

PLC-V8C/PT-24DC/BM2 - Controller

2907446

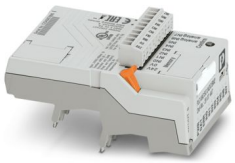
https://www.phoenixcontact.com/us/products/2907446

PLC logic basic module, Generation 2, with 16 I/Os, for plug-in connection to eight digital or analog PLC-INTERFACE terminal blocks, can be extended to 48 I/Os, real-time clock, micro USB female connector, accommodates memory module and Bluetooth adapter, Push-in connection

PLC-V8C/SC-24DC/BM2 - Controller

2907447

https://www.phoenixcontact.com/us/products/2907447



PLC logic basic module, Generation 2, with 16 I/Os, for plug-in connection to eight digital or analog PLC-INTERFACE terminal blocks, can be extended to 48 I/Os, real-time clock, micro USB female connector, accommodates memory module and Bluetooth adapter, screw connection

ZB 6:UNBEDRUCKT - Zack marker strip

1051003

https://www.phoenixcontact.com/us/products/1051003

Zack marker strip, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10.5 mm, Number of individual labels: 10

ZB 6 CUS - Zack marker strip

0824992

https://www.phoenixcontact.com/us/products/0824992

Zack marker strip, can be ordered: Strip, white, labeled according to customer specifications, mounting type: snap into tall marker groove, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10.5 mm, Number of individual labels: 10

ZB 6,LGS:FORTL.ZAHLEN - Zack marker strip

1051016

https://www.phoenixcontact.com/us/products/1051016

Zack marker strip, Strip, white, labeled, can be labeled with: CMS-P1-PLOTTER, printed horizontally: consecutive numbers 1 ... 10, 11 ... 20, etc. up to 491 ... 500, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10.5 mm, Number of individual labels: 10

ZB 6,QR:FORTL.ZAHLEN - Zack marker strip

1051029

https://www.phoenixcontact.com/us/products/1051029

Zack marker strip, Strip, white, labeled, can be labeled with: CMS-P1-PLOTTER, Printed vertically: consecutive numbers 1 ... 10, 11 ... 20, etc. up to 491 ... 500, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6. 15 x 10.5 mm, Number of individual labels: 10

ZB 6,LGS:GLEICHE ZAHLEN - Zack marker strip

1051032

https://www.phoenixcontact.com/us/products/1051032

Zack marker strip, Strip, white, labeled, can be labeled with: CMS-P1-PLOTTER, printed horizontally: Identical numbers 1 or 2, etc. up to 100, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10.5 mm, Number of individual labels: 10

ZB 6,LGS:L1-N,PE - Marker for terminal blocks

1051414

https://www.phoenixcontact.com/us/products/1051414

Marker for terminal blocks, Strip, white, labeled, can be labeled with: CMS-P1-PLOTTER, horizontal: L1, L2, L3, N, PE, L1, L2, L3, N, PE, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10.5 mm, Number of individual labels: 10

ZB 6,LGS:U-N - Marker for terminal blocks

1051430

https://www.phoenixcontact.com/us/products/1051430

Marker for terminal blocks, Strip, white, labeled, can be labeled with: CMS-P1-PLOTTER, printed horizontally: U, V, W, N, GND, U, V, W, N, GND, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 6.15 x 10. 5 mm, Number of individual labels: 10

UC-TM 6 - Marker for terminal blocks

0818085

https://www.phoenixcontact.com/us/products/0818085

Marker for terminal blocks, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.6 x 10.5 mm, Number of individual labels: 80

UC-TM 6 CUS - Marker for terminal blocks

0824589

https://www.phoenixcontact.com/us/products/0824589

Marker for terminal blocks, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: snap into tall marker groove, for terminal block width: 6.2 mm, lettering field size: 5.6 x 10.5 mm, Number of individual labels: 80

UCT-TM 6 - Marker for terminal blocks

0828736

https://www.phoenixcontact.com/us/products/0828736

Marker for terminal blocks, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.6 x 10.5 mm, Number of individual labels: 60

UCT-TM 6 CUS - Marker for terminal blocks

0829602

https://www.phoenixcontact.com/us/products/0829602

Marker for terminal blocks, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: snap into tall marker groove, for terminal block width: 6.2 mm, lettering field size: 5.6 x 10.5 mm, Number of individual labels: 60

NS 35/ 7,5 PERF 2000MM - DIN rail perforated

0801733

https://www.phoenixcontact.com/us/products/0801733

DIN rail perforated, Pack of 25 (50 m), acc. to EN 60715, material: Steel, galvanized, passivated with a thick layer, Standard profile, color: silver

NS 35/ 7,5 UNPERF 2000MM - DIN rail, unperforated

0801681

https://www.phoenixcontact.com/us/products/0801681

DIN rail, unperforated, Pack of 25 (50 m), acc. to EN 60715, material: Steel, galvanized, passivated with a thick layer, Standard profile, color: silver

NS 35/ 7,5 WH PERF 2000MM - DIN rail perforated

1204119

https://www.phoenixcontact.com/us/products/1204119

DIN rail perforated, Pack of 25 (50 m), acc. to EN 60715, material: Steel, Galvanized, white passivated, Standard profile, color: silver

NS 35/ 7,5 WH UNPERF 2000MM-VPE 10 - DIN rail, unperforated

1204122

https://www.phoenixcontact.com/us/products/1204122

DIN rail, unperforated, Pack of 10 (20 m), acc. to EN 60715, material: Steel, Galvanized, white passivated, Standard profile, color: silver

NS 35/ 7,5 AL UNPERF 2000MM - DIN rail, unperforated

0801704

https://www.phoenixcontact.com/us/products/0801704

DIN rail, unperforated, Pack of 25 (50 m), acc. to EN 60715, material: Aluminum, uncoated, Standard profile, color: silver

NS 35/ 7,5 ZN PERF 2000MM - DIN rail perforated

1206421

https://www.phoenixcontact.com/us/products/1206421

DIN rail perforated, Pack of 25 (50 m), acc. to EN 60715, material: Steel, galvanized, Standard profile, color: silver

NS 35/ 7,5 ZN UNPERF 2000MM - DIN rail, unperforated

1206434

https://www.phoenixcontact.com/us/products/1206434

DIN rail, unperforated, Pack of 25 (50 m), acc. to EN 60715, material: Steel, galvanized, Standard profile, color: silver

NS 35/ 7,5 CU UNPERF 2000MM-VPE 10 - DIN rail, unperforated

0801762

https://www.phoenixcontact.com/us/products/0801762

DIN rail, unperforated, Pack of 10 (20 m), acc. to EN 60715, material: Copper, uncoated, Standard profile, color: copper-colored

NS 35/ 7,5 CAP - End cap

1206560

https://www.phoenixcontact.com/us/products/1206560

DIN rail end piece, for DIN rail NS 35/7.5

NS 35/15 PERF 2000MM - DIN rail perforated

1201730

https://www.phoenixcontact.com/us/products/1201730

DIN rail perforated, Pack of 25 (50 m), similar to EN 60715, material: Steel, galvanized, passivated with a thick layer, Standard profile, color: silver

NS 35/15 UNPERF 2000MM - DIN rail, unperforated

1201714

https://www.phoenixcontact.com/us/products/1201714

DIN rail, unperforated, Pack of 25 (50 m), similar to EN 60715, material: Steel, galvanized, passivated with a thick layer, Standard profile, color: silver

NS 35/15 WH PERF 2000MM - DIN rail perforated

0806602

https://www.phoenixcontact.com/us/products/0806602

DIN rail perforated, Pack of 25 (50 m), similar to EN 60715, material: Steel, Galvanized, white passivated, Standard profile, color: white

NS 35/15 WH UNPERF 2000MM-VPE 10 - DIN rail, unperforated

1204135

https://www.phoenixcontact.com/us/products/1204135

DIN rail, unperforated, Pack of 10 (20 m), similar to EN 60715, material: Steel, Galvanized, white passivated, Standard profile, color: silver

NS 35/15 AL UNPERF 2000MM - DIN rail, unperforated

1201756

https://www.phoenixcontact.com/us/products/1201756

DIN rail, unperforated, similar to EN 60715, material: Aluminum, uncoated, Standard profile, color: silver

NS 35/15 ZN PERF 2000MM - DIN rail perforated

1206599

https://www.phoenixcontact.com/us/products/1206599

DIN rail perforated, Pack of 25 (50 m), similar to EN 60715, material: Steel, galvanized, Standard profile, color: silver

NS 35/15 ZN UNPERF 2000MM - DIN rail, unperforated

1206586

https://www.phoenixcontact.com/us/products/1206586

DIN rail, unperforated, Pack of 25 (50 m), similar to EN 60715, material: Steel, galvanized, Standard profile, color: silver

NS 35/15 CU UNPERF 2000MM-VPE 10 - DIN rail, unperforated

1201895

https://www.phoenixcontact.com/us/products/1201895

DIN rail, unperforated, Pack of 10 (20 m), similar to EN 60715, material: Copper, uncoated, Standard profile, color: copper-colored

NS 35/15 CAP - End cap

1206573

https://www.phoenixcontact.com/us/products/1206573

DIN rail end piece, for DIN rail NS 35/15

NS 35/15-2,3 UNPERF 2000MM-VPE 10 - DIN rail, unperforated

1201798

https://www.phoenixcontact.com/us/products/1201798

DIN rail, unperforated, Pack of 10 (20 m), acc. to EN 60715, material: Steel, galvanized, passivated with a thick layer, Standard profile 2.3 mm, color: silver

PLC-ATP BK - Separating plate

2966841

https://www.phoenixcontact.com/us/products/2966841

Separating plate, 2 mm thick, required at the start and end of a PLC terminal strip. Furthermore, it is used for: visual separation of groups, safe isolation of different voltages of neighboring PLC relays in acc. with DIN VDE 0106-101, isolation

PLC-ESK GY - Power terminal block

2966508

https://www.phoenixcontact.com/us/products/2966508

Power terminal block, for the input of up to four potentials, for mounting on NS 35/7.5

SZF 1-0,6X3,5 - Screwdriver

1204517

https://www.phoenixcontact.com/us/products/1204517

Actuation tool, for ST terminal blocks, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip

PLC-RSC- 24DC/21 - Relay Module

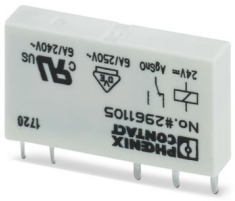
2966171

https://www.phoenixcontact.com/us/products/2966171

REL-MR- 24DC/21 - Single relay

2961105

https://www.phoenixcontact.com/us/products/2961105



Plug-in miniature power relay, with power contact, 1 changeover contact, input voltage 24 V DC

Phoenix Contact USA
586 Fulling Mill Road
Middletown, PA 17057, United States
(+717) 944-1300
info@phoenixcon.com

TRT-10A230V-NC | mechanical

> CONTACT US

Fandis thermostats provide a reliable solution for accurate temperature control in protecting sensitive electronic components. Available with normally closed, normally open or change-over contacts, these mechanical regulators are used with ventilation or heating products to keep the desired thermal conditions inside the enclosure.

Technical data		
APPROVALS		
Approvals	CE; cURus; UKCA	
ELECTRICAL DATA		
Rated Voltage	60	V d.c.
Rated Voltage	110-250	V a.c.
Rated Current	10	A
Operating Voltage	12-60	V d.c.
Appliance Class	II	
Max Contact Current	15	A
GENERIC DATA		
Contact Type	NC / Open on rise	
Sensor Type	Bi-Metal	
Casing Material	PA66 UL94 V-0	
RAL Number	7035	
Setting Range	-10÷80 14÷176	°C °F
Setting Resolution	5 41	°C °F
Accuracy	± 3	K
Rated Hysteresis	7	K
Life Expectancy	100000	Cycles
Electrical Connection	Terminal Block	

TRT-10A230V-NC | mechanical

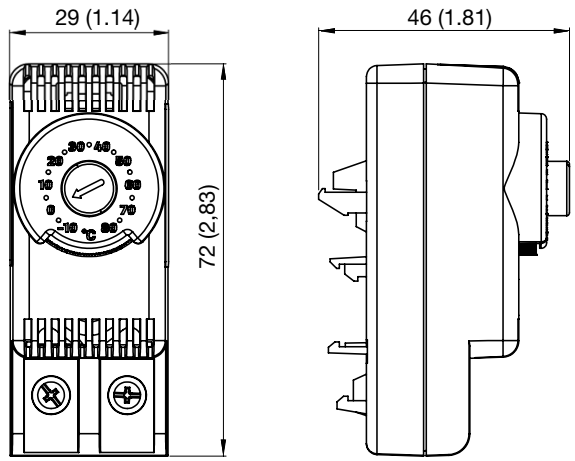
> CONTACT US

Technical data		
Wires Section	0.75-2.5	mm^2
Wires Section	18-14	AWG
Fixing System	DIN rail	
ENVIRONMENTAL AND THERMAL DATA		
IP Protection Degree	IP20	
Operating Temperature	-10÷80 14÷176	°C °F
Storage Temperature	-40÷90 -40÷194	°C °F
Max Humidity	90	% RH
UL DATA		
UL File Number Recognized Component	E247491	
UL Environmental Type Rating	Open Type	
UL Ambient Temperature	50 122	°C °F

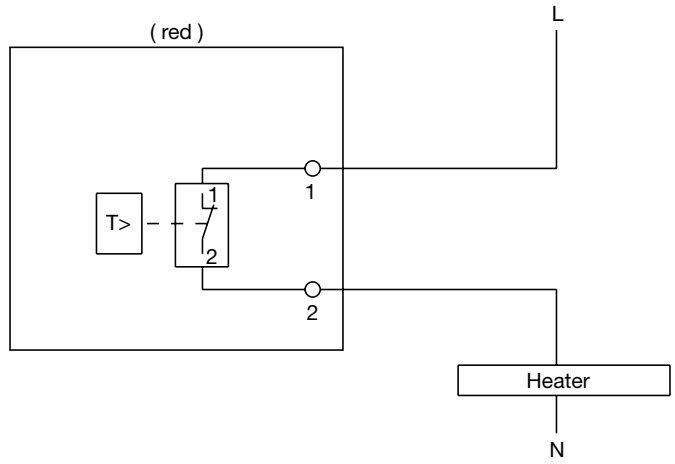
TRT-10A230V-NC | mechanical

> CONTACT US

Technical drawing mm (in)



Wiring Diagram



TRT-10A230V-NO | mechanical

> CONTACT US

Fandis thermostats provide a reliable solution for accurate temperature control in protecting sensitive electronic components. Available with normally closed, normally open or change-over contacts, these mechanical regulators are used with ventilation or heating products to keep the desired thermal conditions inside the enclosure.

Technical data		
APPROVALS		
Approvals	CE; cURus; UKCA	
ELECTRICAL DATA		
Rated Voltage	60	V d.c.
Rated Voltage	110-250	V a.c.
Rated Current	10	A
Operating Voltage	12-60	V d.c.
Appliance Class	II	
Max Contact Current	15	A
GENERIC DATA		
Contact Type	NO / Close on rise	
Sensor Type	Bi-Metal	
Casing Material	PA66 UL94 V-0	
RAL Number	7035	
Setting Range	-10÷80 14÷176	°C °F
Setting Resolution	5 41	°C °F
Accuracy	± 3	K
Rated Hysteresis	7	K
Life Expectancy	100000	Cycles
Electrical Connection	Terminal Block	

TRT-10A230V-NO | mechanical

> CONTACT US

Technical data		
Wires Section	0.75-2.5	mm^2
Wires Section	18-14	AWG
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IP Protection Degree	IP20	
Operating Temperature	-10÷80 14÷176	°C °F
Storage Temperature	-40÷90 -40÷194	°C °F
Max Humidity	90	% RH
UL DATA		
UL File Number Recognized Component	E247491	
UL Environmental Type Rating	Open Type	
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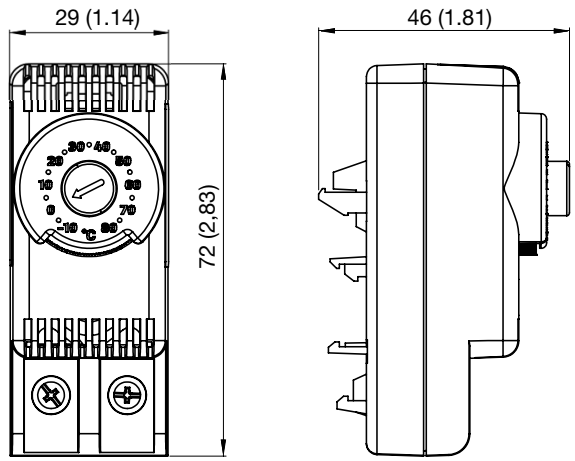
TRT-10A230V-NO | mechanical

> CONTACT US

Technical drawing mm (in)



Wiring Diagram