Remote I/O

IS1+ Remote I/O Digital output module
For Zone 1 Ex i
9475/32-04-72 Art. No. 218063

- 4 channels for Ex i hydraulic and solenoid valves up to 95 mA
- Ex ib outputs with line fault monitoring, an LED fault and status display for each channel and SIL2 shutdown input
- Modules in Zone 1 can be replaced without having to disconnect the power supply (i.e. hot-swapped)

MY R. STAHL **9475F**

The 9475/32-04-72 digital output modules for Zone 1 have four channels for actuating Ex i hydraulic and solenoid valves or indicator lamps. An additional Ex i control input is suitable for safe shutdown up to SIL 2. All outputs are short-circuit proof, galvanically separated from the system and individually monitored to check for wire breakage/short-circuiting.

Technical Data

Explosion Protection	
Application range (zones)	1, 2
Ex interface zone	1, 2, 21, 22
IECEx gas certificate	IECEx DEK 12.0070X
IECEx gas explosion protection	Ex ia [ib Gb] IIC T4 Gb
IECEx dust certificate	IECEx DEK 12.0070X
IECEx dust explosion protection	[Ex ib Db] IIIC
ATEX gas certificate	DEKRA 12 ATEX0232X
ATEX gas explosion protection	II 2 (2) G Ex ia [ib Gb] IIC T4 Gb
ATEX dust certificate	DEKRA 12 ATEX0232X
ATEX dust explosion protection	II (2) D [Ex ib Db] IIIC
FMus certificate	FM17US0332X
cFM certificate	FM16CA0134X
Marking cFMus	IS, Class I, Div. 2, Groups A,B,C,D; Class I, Zone 1, AEx/Ex ia [ib] IIC NIFW Class I,II,III, Div. 2, Groups A,B,C,D,E,F,G; T4 at Ta = 75°C See Doc. 9475 6 031 005 1
Certificates	ATEX (DEK), Brazil (ULB), Canada (FM), China (NEPSI), IECEx (DEK), India (PESO), Korea (KTL), SIL (exida), USA (FM)
Ship approval	ABS, BVIS, EU RO MR (DNV), KR, LR
Declaration of Conformity	ATEX (EUK), China (CCC)
Installation	Zone 1, Zone 2 and safe areas
Further information	See relevant certificate and operating instructions
Safety Data	
Max. voltage U_o	15.4 V
Max. current I_o (Ex ia)	0 mA
Max. power P_o (Ex ia)	0 mW
Max. current I_o (Ex ib)	115.4 mA

Safety Data

Max. power P_o (Ex ib)		1475 mW					
Internal inductance		Negligible					
Max. internal capacitance C_i		33 nF (in the following tables, C_i has been subtracted from C_o)					
Max. connectable inductance L_o/capacitance C_o							
IIC	L_o [mH]	0.11	0.1	0.05	0.02	0.01	
	C_o [nF]	257	267	337	477	488	
		for ≤ 700 m conductor (≤ 1 µH/m; ≤ 200 pF/m; 10.76 mOhm/m)					
	L_o [mH]	0.05					
	C_o [nF]	217					
IIB/IIIC	L_o [mH]	2.9	2.0	1.0	0.5	0.05	0.02
	C_o [nF]	1467	1767	2367	2667	2767	3157
		for ≤ 2000 m conductor (≤ 1 µH/m; ≤ 200 pF/m; 10.76 mOhm/m)					
	L_o [mH]	2.0	1.0	0.5	0.002		
	C_o [nF]	1667	2367	2667	3967		

Ex i control input "Plant STOP"			
Connection terminals	X3 1, 2 (without galvanic separation, compatible with 9575/22)		X3 3, 4 (with galvanic separation, switchable in parallel)
Type of protection	Ex ia		Ex ia
Max. voltage U_o	5.1 V		– –
Max. current I_o	0.44 mA		– –
Max. power P_o	0.5 mW		– –

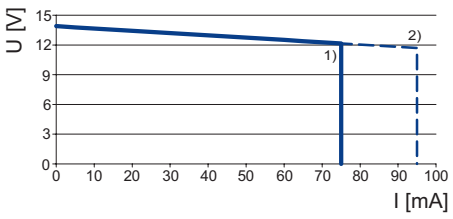
Max. connectable inductance L_o/capacitance C_o								
IIC	L_o [mH]	100	10	2	1	0.2	0.01	– –
	C_o [nF]	2.195	2.595	3.295	3.695	5.495	15.995	
IIB/IIIC	L_o [mH]	100	10	2	1	0.2	0.01	– –
	C_o [nF]	9.995	12.995	16.995	19.995	31.995		

Max. voltage U_i	– –	30 V
Max. internal resistance R_i	– –	4940 Ω
Max. internal capacitance C_i	5.2 nF (in the tables above, C_i has been subtracted from C_o)	Negligible
Max. internal inductance L_i	Negligible	Negligible

Electrical Data

Number of channels	4 (3) Ex i inputs (depends on nominal output current)
Connection Ex i field signals	Pluggable, blue terminals, 16-pin, 2.5 mm², screw type or cage clamp version with lock
Connection Ex i Steuereingang	Pluggable, blue terminals, 2-pin, 2.5 mm², screw type version with lock

Ex i X3 control input Connection terminals		X3 1, 2 (without galvanic separation, compatible with 9575/22)	X3 3, 4 (with galvanic separation, switchable in parallel)
	Supply voltage	3.3 V	– –
	Internal resistance	20.5 kΩ	– –
	Control voltage for all outputs "OFF" ("Plant STOP" activated)	> 2.2 V	< 1 V
	"Normal operation" ("Plant STOP" deactivated)	< 0.7 V	> 6 V

Auxiliary Power	
Power supply connection	BusRail types 9494
Auxiliary power version	Intrinsically safe Ex ia via BusRail
Behaviour during undervoltage	All outputs "OFF"
Current consumption	250 mA
Max. power consumption	6 W
Max. power dissipation outputs	5.8 W
Max. power dissipation rated operational current	3.4 W
Galvanic Isolation	
Test voltage for galvanic separation	Acc. to standard EN 60079-11
Auxiliary power/system components	≥ 1500 V AC
I/O module / I/O module	≥ 500 V AC
I/O channels/system components	≥ 500 V AC
I/O channels / ground (PA)	≥ 500 V AC
I/O channels/plant STOP X3 3,4	≥ 500 V AC
Plant STOP X3 3,4/earth (PA)	≥ 500 V AC
Input	
Control input	Ex i control input X3
Control input suitability	Shutdown up to SIL 2, low demand (IEC 61508)
Control input function	"Plant STOP" for switching off all outputs
Output	
Ex i output rated operation	12.3 V/75 mA 11.7 V/95 mA
Internal resistance of outputs	23.2 Ω
Open-circuit voltage U_a	13.8 V
9475/32-04-72 output characteristic	9475/32-04-72  Note: During operation with four outputs and a total current > 320 mA, output 4 is pulsed. Reduce the load current to < 320 mA.

[1] 4 channels
[2] Max. 3 channels

Device Specific Data	
Diagnostics message module	ON OFF
Line fault monitoring	OFF ON ON without test current
Test current signal	0,54 ... 0,66 mA
Output behaviour in case of error	OFF ON Keep last value
LED module requires maintenance	"M/S" LED, blue
LED operating conditions	"RUN" LED, green
LED channel error	LED for each channel, red
LED channel status	LED per channel, yellow
"Plant STOP" LED	"Plant STOP" LED, yellow (all outputs are high-impedance)
Retrievable parameters	Type Software revision Hardware revision Manufacturer Serial number
Signal status bit	"1" = Output supplied with power "0" = High-impedance output
Wire breakage output	> 1 kΩ (response range 1 to 5 kΩ) (when the test current is deactivated, can only be detected if the output is switched on)
Short circuit output	< 30 Ω (response range 30 to 70 Ω) (can be detected only if the output is switched on)
Diagnostics	
LED group error	"ERR" LED, red
Ambient Conditions	
Ambient temperature	-40°C ... +75°C
Ambient temperature	-40°F ... +167°F
Storage temperature	-40°C ... +80°C
Storage temperature	-40°F ... +176°F
Max. operating altitude	< 2000 m
Max. relative humidity	95% (without condensation)
Shock (semi-sinusoidal)	(IEC EN 60068-2-27) 15 g (3 shocks per axis and direction)
Vibration (sinusoidal)	(IEC EN 60068-2-6) Frequency range 2 to 13.2 Hz Amplitude 1 mm (peak value) Frequency range 13.2 to 100 HzAcceleration amplitude 0.7 g
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 (2006) IEC 61000-4-1 to 61000-4-6, NAMUR NE 21
Note	(observe operating instructions)
Mechanical Data	
Degree of protection (IP) (IEC 60529)	IP20
Module enclosure	Polyamide 6GF
Fire resistance (UL 94)	V2
Pollutant class	Corresponds to G3
Width	96.5 mm

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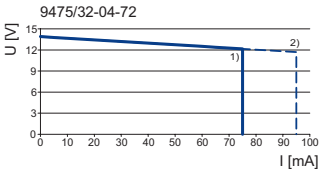
Mechanical Data

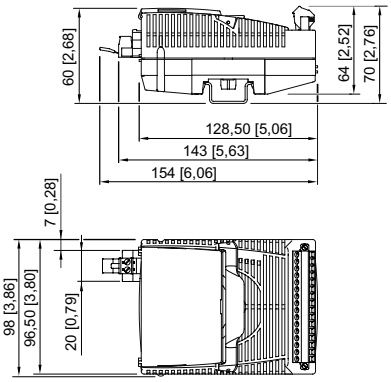
Width, inches	3.8 in
Height	67 mm
Length	128 mm
Length, inches	5.04 in
Mounting depth, inches	2.64 in
Weight	275 g
Weight	0.61 lb
Mounting / Installation	
Mounting type	on NS 35/15 DIN rail (DIN EN 60715)
Mounting orientation	Vertical Horizontal

Technical Drawings – Subject to Alterations



9475/32-04-72 output characteristic

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations

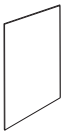


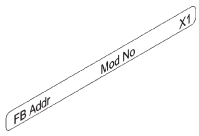
Accessories

Pluggable terminal		Art. No.
	2.5 mm² with lock, 16-pin, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 1 to 16 Note: A second terminal is additionally required for I/O module Series 9470 and 9482 Labelling: 17 to 32	162702
	2.5 mm² with lock, 16-pin, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks Labelling: 1 to 16 Note: A second terminal is additionally required for I/O module Series 9470 and 9482 Labelling: 17 to 32	162695

Partition		Art. No.
	For mounting between intrinsically safe and non-intrinsically safe connections between I/O modules to maintain a tight string length of 50 mm	220101

Warning label		Art. No.
	"Clean modules only with a damp cloth."	162796

DIN A4 sheet		Art. No.
	For label plate on I/O modules; 6 plates per sheet; IS Wizard printout; packaging unit = 20 sheets	162832

Labelling strips		Art. No.
	"FB Addr … Mod No …" for pluggable terminal, 26 pieces on the sheet	162788

Vibration bracket set		Art. No.
	When installed in environments with extreme vibration (> 0.7 g and max. 4 g), the 9490 vibration brackets may be used as an additional measure and provide mechanical stability for the individual modules. For mounting: All I/O modules, except 9477/12 and 9478 Number of brackets in a set: 8 Screws (item no. 275516) must be ordered separately.	271920

Set of screws		Art. No.
	Set of M5 x 14 screws (self-tapping) for 9490 vibration brackets Number of screws in a set: 25	275516

Spare Parts

Ex i LED indicator lamp		Art. No.
	8010/3-02 LED indicator lamp for intrinsically safe circuits, Ex i	237972

LED indicator lamp for front installation		Art. No.
	for Ex i front installation	240901