

09729E00

Digital Output Module 4-Channel Version Series 9475/.2-04-.. from Rev. F

- 4 channels for Ex i / I.S. solenoid valves, piezo and booster valves
- Intrinsically safe outputs Ex ia IIC
- Additional input for "Plant-STOP" available (acc. to IEC 61508 up to SIL 2)
- Galvanic isolation between outputs and system
- Open-circuit and short-circuit monitoring for each field circuit
- Functions with adjustable parameters
- Module can be replaced in operation (hot swap)

Zone	0	1	2	20	21	22
Class	I			II / III		
Zone	0	1	2	20	21	22
Ex interface	X	X	X	X	X	X
Installation in		X	X		X ^{*)}	X ^{*)}

Class	I		II / III	
Division	1	2	1	2
Ex interface	X	X	X	X
Installation in	X	X	X ^{*)}	X ^{*)}

^{*)} suitable enclosure necessary

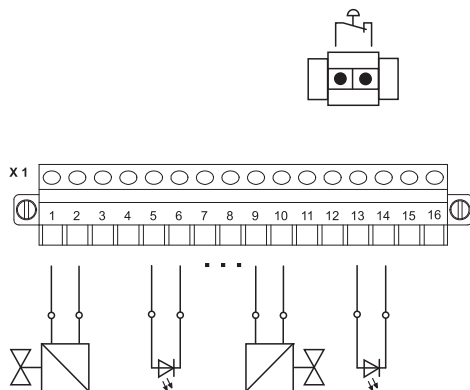


The Digital Output Modules are used for the operation of up to 4 intrinsically safe solenoid valves or indicators. The outputs are short-circuit proof.

All channels are individually monitored for open-circuit and short-circuit. Open-circuit monitoring is also active when the output is de-energized.

The interface of the Digital Output Module with the internal data bus of the BusRail is designed with redundancy.

Modules 9475/22-04-.1 are equipped with an additional Ex i / I.S. digital input for disconnecting all outputs of a module simultaneously ("Plant-STOP") acc. to SIL2 / IEC 61508.



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Selection Table

Version	Channels	Safety data Ex ia IIC		Digital input (Outputs OFF)	Order number	Weight kg / lbs
		Max. voltage U_o / V_{oc}	Max. current I_o / I_{sc}			
Digital Output Module	4	19.9 V	150 mA	no	9475/12-04-11	0.275 / 0.606
		26.2 V	110 mA	no	9475/12-04-21	0.275 / 0.606
		26.2 V	90 mA	no	9475/12-04-31	0.275 / 0.606
		26.2 V	110 mA	yes	9475/22-04-21	0.275 / 0.606

Explosion Protection

Certificates

IECEX	PTB 06.0001X
Europe (ATEX)	PTB 99 ATEX 2220
USA (NEC)	3007532 (FM)
Russia (GOST-R)	04.B00806 (CTB)
Other countries	Canada (CSA), Brazil (INMETRO), Belarus (Promatomnadzor)

Marking

IECEX	Ex ib [ia] IIC/IIB T4
Europe (ATEX)	Ⓔ II 2 (1) G EEx ib [ia] IIC / IIB T4 Ⓔ II (1/2) D [Ex iaD/ibD]
USA (NEC)	IS/II/1/ABCD/T4 Ta = 65 °C, IS/II/1/IIC/T4 Ta = 65 °C, AIS/I,II,III/1/ABCDEFGH, [AEx ia] IIC, NI/II/2/ABCD/T4 Ta = 65 °C, NI/II/2/IIC/T4 Ta = 65 °C, AIS/I,II,III/1/ABCDEFGH, [AEx ia] IIC
Russia (GOST-R)	1Exib[ia]IIC/IIBT4

Other certificates

Marine (DNV, ABS)

Safety data

for digital outputs (ATEX)

Ex ib	Type	U_o / V_{oc} [V]	I_o / I_{sc} [mA]	P_o [mW]	L_o / L_a [mH]		C_o / C_a [nF]	
					IIC	IIB	IIC	IIB
	9475/12-04-11	19.9	60	714	2	5	100	840
	9475/12-04-21	26.2	60	722	0.5	5	69	300
	9475/22-04-21							
	9475/12-04-31	26.2	60	585	0.5	5	73	320

The effective internal capacitances and inductances are negligible.

Ex ia	Type	U_o / V_{oc} [V]	I_o / I_{sc} [mA]	P_o [mW]	L_o / L_a [mH]		C_o / C_a [nF]	
					IIC	IIB	IIC	IIB
	9475/12-04-11	19.9	150	742	1.30	7.0	223	1420
	9475/12-04-21	26.2	110	722	1.45	9.09	97	750
	9475/22-04-21							
	9475/12-04-31	26.2	90	585	2.44	14.3	97	750

The effective internal capacitances and inductances are negligible.

Safety data

for digital input (ATEX)

Ex ia	Only type	U_o / V_{oc} [V]	I_o / I_{sc} [mA]	P_o [mW]	L_o / L_a [mH]		C_o / C_a [nF]	
					IIC	IIB	IIC	IIB
	9475/22-04-21	6.6	67	110	8.24	31.4	22	500

The effective internal capacitances and inductances are negligible.

Further information

see respective certificate



Explosion Protection

Functional safety (IEC 61508)

Digital input	"Plant-STOP"
Test report	Exida FMEDA Stahl 03/05-19R001
Max. SIL	2
Safe state	All outputs "OFF"
Safe Failure Fraction SFF	85.8 % (type A)
MTBF (to SN 29500)	55 years (at 40 °C / 104 °F)
PFD _{AVG} at T _[Proof]	T[Proof] 1 year 5 years 10 years
	PFD _{AVG} 1.53 x 10 ⁻⁴ 7.67 x 10 ⁻⁴ 1.53 x 10 ⁻³
Further information	see test report

Technical Data

Ex i / I.S. outputs

Type	No-load voltage [V]	U [V]	I [mA]	R _i [Ω]
9475/12-04-11	17.4	11.2	40	155
9475/12-04-21	23.1	12.3	40	271
9475/22-04-21				
9475/12-04-31	23.1	9.7	40	334

Number of channels

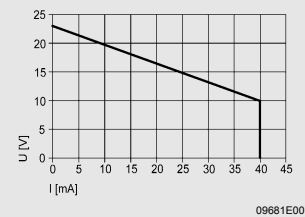
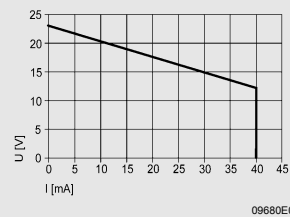
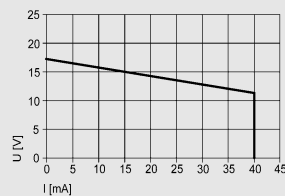
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Output characteristics

9475/.2-04-11

9475/.2-04-21

9475/.2-04-31



Digital input; Ex i / I.S.

Function Deactivate all outputs ("Plant-Stop"), only type 9475/22-04-21

Supply voltage 5 V

Internal resistance 1.6 kΩ

Max. voltage for outputs in normal operation 1 V

Min. voltage for disconnecting all outputs ("Plant-STOP") 3.5 V

Use acc. to EN 61508 Up to SIL 2

Galvanic isolation

between power supply and system components 1500 V AC

between two input / output modules 500 V AC

between inputs/outputs and system components 500 V AC

The outputs and the input "Plant-STOP" of an I/O module have a common negative conductor.

Settings





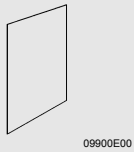

Open-circuit and short-circuit monitoring ON, ON without testing current, OFF

Safety position (output during communication faults) OFF, ON, hold last value

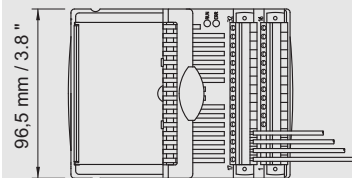
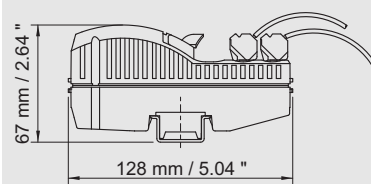


Technical Data		
Diagnostics		
Retrievable parameters	Manufacturer, type, version, serial number	
Module faults	<ul style="list-style-type: none"> • Internal primary bus faults • Internal redundant bus faults • No response • Module does not correspond to configuration • Hardware fault • Hardware disconnection of outputs (by "Outputs OFF") 	
Signal fault		
Open circuit	> 10 kΩ	
Short circuit	< 95 Ω	
Terminal voltage for non-linear loads	> 4 V	
Power supply		
Behaviour with undervoltage	All outputs are switched "OFF"	
Typical power input	Type	All outputs short-circuited
	9475/12-04-11	4.6 W
	9475/12-04-21, 9475/22-04-21	6.2 W
	9475/12-04-31	6.2 W
Typical power dissipation	Type	All outputs short-circuited
	9475/12-04-11	4.6 W
	9475/12-04-21, 9475/22-04-21	6.2 W
	9475/12-04-31	6.2 W
Mechanical data		
Module enclosure	Polyamide 6GF	
Fire protection class (UL 94)	V2	
Degree of protection (IEC 60529)		
Modules	IP30	
Connections	IP20	
Electrical connection		
Ex i / I.S. field signals	Plug-in terminals 16-pole with catch, 2.5 mm ² / up to 14 AWG, screw or spring type	
Operator interface		
Operation	LED green "RUN"	
Fault	LED red "ERR"	
Installation conditions		
Mounting type	on 35 mm DIN rail NS 35/15	
Installation position	horizontal and vertical	
Ambient conditions		
Ambient temperature	- 20 ... + 65 °C / - 4 ... + 149 °F	
Storage temperature	- 40 ... + 70 °C / - 40 ... + 158 °F	
Maximum relative humidity	95 % (no condensation)	
Vibration, sinusoidal (IEC EN 60068-2-6)	1 g in frequency range between 10 ... 500 Hz 2 g in frequency range 45 ... 100 Hz	
Shock, semi-sinusoidal (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)	
Electromagnetic compatibility	Tested according to the following standards and regulations: EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21	
Note	You will find a list of compatible Ex i / I.S. solenoid valves, indicating lamps, etc. on our homepage www.stahl.de .	

Accessories and Spare Parts

Designation	Illustration	Description	Order number
Plug-in terminal		2.5 mm ² / 14 AWG with catch, 16-pole, screw connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	162702
		2.5 mm ² / 14 AWG with catch, 16-pole, spring connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits including test jacks Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	162695
Labelling strips		„FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels	162788
Warning sign		„Only clean modules with damp cloths“	162796
DIN A4 sheet		For I/O module labels; 6 labels each sheet; print out with IS Wizard software; packaging unit = 20 sheets	162832
Partition		For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance	162740

Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



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