Inductive sensor

PL4-F25-N4-K

For installation in housing PL4... with 2 valve connections
Pluggable cage clamp terminals
Valve LEDs disconnectable (wire jumper)
Satisfies machinery directive
EC-Type Examination Certificate
TÜV99 ATEX 1479X

CE
0102

General specifications	
Switching element function	DC Dual NC
Rated operating distance s_n	3 mm
Installation	embeddable mountable
Output polarity	NAMUR
Assured operating distance s_a	0 ... 2.43 mm
Reduction factor r_{Al}	0.5
Reduction factor r_{Cu}	
Reduction factor r_{304}	1
Reduction factor r_{St37}	1.2
Nominal ratings	
Nominal voltage U_o	8.2 V (R_i approx. 1 kΩ)
Operating voltage U_B	5 ... 25 V
Switching frequency f	0 ... 100 Hz
Hysteresis H	typ. 5 %
Reverse polarity protected	reverse polarity protected
Suitable for 2:1 technology	yes , Reverse polarity protection diode not required
Current consumption	
Measuring plate not detected	≥ 3 mA
Measuring plate detected	≤ 1 mA
Indication of the switching state	LED, yellow
Valve status indication	LED, yellow
Ambient conditions	
Ambient temperature	-25 ... 100 °C (-13 ... 212 °F)
Storage temperature	-40 ... 100 °C (-40 ... 212 °F)
Mechanical specifications	
Connection (system side)	Cage tension spring terminals
Core cross-section (system side)	up to 2.5 mm²
Connection (valve side)	Cage tension spring terminals
Core cross-section (valve side)	up to 2.5 mm²
Housing material	PBT
Sensing face	PBT
General information	
Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G
Compliance with standards and directives	
Standard conformity	
NAMUR	EN 60947-5-6:2000
Electromagnetic compatibility	NE 21:2007
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

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ATEX 1G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 1G	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2006, EN 60079-11:2007, EN 60079-26:2007 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
CE symbol	CE 0102
Ex-identification	Ex II 1G Ex ia IIC T6
EC-Type Examination Certificate	TÜV 99 ATEX 1479 X
Appropriate type	PL.-F25.-N4...
Effective internal capacitance C_i	≤ 100 nF A cable length of 10 m is considered. The value is applicable for the sensor circuit.
Effective internal inductance L_i	≤ 100 µH A cable length of 10 m is considered. The value is applicable for the sensor circuit.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions. The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
Highest permissible ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1:2007 has already been accounted for in the temperature table for category 1.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety. The associated apparatus must satisfy the requirements of category ia. Due to the possible danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation of the power supply and signal circuit is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met. The jumper, WJ, is detachable and must be completely removed to prevent contact with adjacent components.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. Only changes specifically described in these operating instructions are allowed.

Special conditions

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Electrostatic charging	When used in group IIB/IIC non-permissible electrostatic charges should be avoided on the plastic housing parts..
Lead insertion	The connection cables should either be fixed when laid and mechanically protected or installed in such a way, that a force of 30 N applied in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11. Depending on the type of installation, a suitable cable in accordance with Type A oder B of IEC 60079-14, must be used.

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ATEX 2G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 2G	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2006, EN 60079-11:2007 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
CE symbol	CE 0102
Ex-identification	Ex II 1G Ex ia IIC T6
EC-Type Examination Certificate	TÜV 99 ATEX 1479 X
Appropriate type	PL.-F25.-N4...
Effective internal capacitance C_i	≤ 100 nF ; a cable length of 10 m is considered. The value is applicable for the sensor circuit.
Effective internal inductance L_i	≤ 100 µH ; a cable length of 10 m is considered. The value is applicable for the sensor circuit.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions. The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
Highest permissible ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety. The jumper, WJ, is detachable and must be completely removed to prevent contact with adjacent components.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. Only changes specifically described in these operating instructions are allowed.

Special conditions

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Electrostatic charging	When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts.
Lead insertion	The connection cables should either be fixed when laid and mechanically protected or installed in such a way, that a force of 30 N applied in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11. Depending on the type of installation, a suitable cable in accordance with Type A oder B of IEC 60079-14, must be used.

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ATEX 3G (nL)

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3G (nL)	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-15:2005 Ignition protection category "n" Use is restricted to the following stated conditions
CE symbol	CE 0102
Ex-identification	Ex II 3G Ex nL IIC T6 X
Effective internal capacitance C_i	≤ 100 nF ; A cable length of 10 m is considered. The value is applicable for the sensor circuit.
Effective internal inductance L_i	≤ 100 µH ; A cable length of 10 m is considered. The value is applicable for the sensor circuit.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed! Directive 94/9EG is generally applicable only to the use of electrical apparatus operating at atmospheric conditions. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with energy-limited circuits, which satisfy the requirements of IEC 60079-15. The explosion group depends on the connected, energy-limited power supply circuits. The maximum values of the connected, energy-limited valve circuits, must be observed. The sensor must be installed in a housing in such a way, that a protection class of at least IP20 is achieved in accordance with IEC 60529. The jumper, WJ, is detachable and must be completely removed to prevent contact with adjacent components.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. Only changes specifically described in these operating instructions are allowed.

Special conditions

Maximum permissible ambient temperature T_{Umax} at Ui = 20 V	Each sensor circuit can be operated with the stated maximum values and with simultaneous operation of the valve circuits.
for Pi=34 mW, Ii=25 mA, T6	62 °C (143.6 °F)
for Pi=34 mW, Ii=25 mA, T5	64 °C (147.2 °F)
for Pi=34 mW, Ii=25 mA, T4-T1	64 °C (147.2 °F)
for Pi=64 mW, Ii=25 mA, T6	59 °C (138.2 °F)
for Pi=64 mW, Ii=25 mA, T5	59 °C (138.2 °F)
for Pi=64 mW, Ii=25 mA, T4-T1	59 °C (138.2 °F)
for Pi=169 mW, Ii=52 mA, T6	41 °C (105.8 °F)
for Pi=169 mW, Ii=52 mA, T5	41 °C (105.8 °F)
for Pi=169 mW, Ii=52 mA, T4-T1	41 °C (105.8 °F)
for Pi=242 mW, Ii=76 mA, T6	29 °C (84.2 °F)
for Pi=242 mW, Ii=76 mA, T5	29 °C (84.2 °F)
for Pi=242 mW, Ii=76 mA, T4-T1	29 °C (84.2 °F)
Maximum values of the valve circuit	U_i = 32 V; I_i = 240 mA; C_i = 10 nF; L_i = 20 µH The values are applicable to each valve circuit. A cable length of 10 m is taken into account.
Protection from mechanical danger	The sensor must not be exposed to **ANY FORM** of mechanical danger. When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Protection from UV light	The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.
Electrostatic charging	When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts.
Lead insertion	The connecting cable must be protected from tension and torsional loading or installed in such a way, that an applied force of 30 N, acting in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11.

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