

M/80 series Inline Flow Sensor

- Measurement of flow, pressure, temperature and total consumption for the efficient use of compressed air and Nitrogen
- Digital Transmission of parameters via IO-link
- Integrated TFT display for easy identification
- High accuracy, repeatability and measurement dynamics
- Protection class III IP65, IP67



Technical features

Medium:
Compressed air and Nitrogen

Pressure range:
-1 ... 16 bar (-14 ... 232 psi)

Pressure type:
Relative pressure

Temperature coefficient [1/K]:
±0.07 % MW

Accuracy (in the measuring range)*:
class 141: ± (2 % MW + 0,5 % MEW); class 344: ± (6 % MW + 0,6 % MEW); air quality to ISO 8573-1:2010; at medium temperature 23 °C

*MW = measured value;
MEW = Final value of the measuring range

Repeatability:
± (0,4 % MW + 0,1 % MEW)

Response time:
0.1 s; (dAP = 0)

Damping process value dAP:
0...5 s

Pressure monitoring
Response time:
0.05 s

Temperature monitoring
Dynamic response T05 / T09:
T09 = 0,5 s

Display:
Colour display 1,44", 128 x 128 pixels
2 x LED, yellow

Mounting position:
Refer the Installation position section of the Operation Manual

Vibration proof:
5 g (10...2000 Hz)
DIN EN 68000-2-6

Ambient/Media temperature:
Media:
-10... +60°C (14 ... 140°F)
Air supply must be dry enough to avoid ice formation at temperature below +2°C (+35°F)

Storage temperature:
-20 ... +85°C (-4 ... 185°F)

Max relative air humidity:
90%

Materials:
Housing:
PBT+PC-GF30; PPS GF40; stainless steel (304/1.4301); stainless steel (303/1.4305); steel (1.5523) galvanised; 2.0401 (brass / CW614N); FKM
Wetted parts:
Stainless steel (304/1.4301); stainless steel (303/1.4305); FKM; ceramics glass passivated; PPS GF40; Al2O3 (ceramics); acrylate

Electrical parameters

Electrical connection:
M12 x 1 (contacts gold plated)

Power supply:
UB = 18 ...30 VDC
Reverse polarity protection (according to EN 50178 SELV/ PELV)

Current consumption:
< 80 mA

Switching mode:
PNP/NPN

Output signal:
Switching signal; analogue signal; pulse signal; IO-Link; (configurable)

Contact rating:
4...20 mA; (scalable)

MTTF:
183 years

Switching logic:
NO/NC programmable

Operating mode:
Hysteresis / window; NO / NC; current/pulse output; display can be rotated and switched off; Display unit; totaliser

Electromagnetic compatibility:
DIN EN 60947-5-9

Technical data: DN15 Process Connection -M/80/IOL/15T/CC & M/80/IOL/15C/CC

Product characteristics	
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1
Process connection	threaded connection R 1/2 or 1/2" NPT
Parameter setting options	hysteresis / window; normally open / normally closed; current/pulse output; display can be rotated and switched off; Display unit; totaliser

Application		
Application	for industrial applications	
Media	compressed air and nitrogen	
Medium temperature [°C]	-10...60 °C	14...140 °F
Min. bursting pressure	64 bar	6.4 MPa
Pressure rating bar	16 bar	1.6 MPa
MAWP (for applications according to CRN)	9,7 bar	

Measuring/setting range - M/80/IOL/15T/CC			
Measuring range	4...1250 l/min	0.3...99.8 m/s	0.25...75 m³/h
Display range	0...1500 l/min	0...119.8 m/s	0...90 m³/h
Resolution	1 l/min	0.1 m/s	0.05 m³/h
Set point SP	11...1250 l/min	0.9...99.8 m/s	0.65...74.97 m³/h
Reset point rP	5...1243 l/min	0.4...99.3 m/s	0.28...74.6 m³/h
Analogue start point ASP	0...1000 l/min	0...79.8 m/s	0...60 m³/h
Analogue end point AEP	250...1250 l/min	20...99.8 m/s	15...75 m³/h
Low flow cut-off LFC	1...13 l/min	0.1...1.1 m/s	0.09...0.8 m³/h
In steps of	1 l/min	0.1 m/s	0.01 m³/h

Inputs / outputs	
Inputs	
Inputs	counter reset
Outputs	
Output signal	switching signal; analogue signal; pulse signal; IO-Link; (configurable)
Electrical design	PNP/NPN
Number of digital outputs	2
Output function	normally open / normally closed; (parameterisable)
Max. voltage drop switching output DC [V]	2,5
Permanent current rating of switching output DC [mA]	150; (per output)
Number of analogue outputs	1
Analogue current output [mA]	4...20; (scalable)
Max. load Ω	500
Pulse output	consumed quantity meter
Short-circuit protection	yes
Type of short-circuit protection	pulsed
Overload protection	yes

Electrical data	
Operating voltage [V]	18...30 DC; (to SELV/PELV)
Protection class	III
Reverse polarity protection	yes
Power-on delay time	1 s

Pressure monitoring	R 1/2	1/2" NPT
Measuring range	-1...16 bar	-15 ... 232 psi
Display range	-1...20 bar	-15 ... 290 psi
Resolution	0,05 bar	1 psi
Set point SP	-0.92...16 bar	-13 ... 232 psi
Reset point rP	-1...15.92 bar	-15 ... 231 psi
Analogue start point	-1...12.8 bar	-15 ... 186 psi
Analogue end point	2.2...16 bar	32 ... 232 psi
In steps of	0,01 bar	1 psi
Repeatability (% of the final value)	± 0.2	
Characteristics deviation 1% (of the final value)	< ± 0.5; (BFSL = Best Fit Straight Line)	
Greatest TEMPCO of the span (% MEW / 10 KJ)	± 0.3	
Greatest TEMPCO of the zero point (% MEW / 10 KI)	± 0.1	

Measuring/setting range - M/80/IOL/15C/CC *			
Measuring range	8...2648 scfh	0.15...44.15 scfm	1...327.4 ft/s
Display range	0...3178 scfh	0...52.95 scfm	0...393 ft/s
Resolution	2 scfh	0.05 scfm	0.2 ft/s
Set point SP	23...2648 scfh	0.38...44.13 scfm	2.8...327.3 ft/s
Reset point rP	10...2635 scfh	0.16...43.91 scfm	1.2...325.7 ft/s
Analogue start point ASP	0...2119 scfh	0...35.31 scfm	0...261.9 ft/s
Analogue end point AEP	530...2649 scfh	8.83...44.14 scfm	65.5...327.4 ft/s
Low flow cut-off LFC	3...28 scfh	0.05...0.47 scfm	0.4...3.5 ft/s
In steps of	1 scfh	0.01 scfm	0.1 ft/s

Volumetric flow quantity monitoring	R 1/2	1/2" NPT
Measuring range	0 ... 100000000 m³	0...353146667.2 scf
Display range	0 ... 100000000 m³	0...353146667.2 scf
Set point SP	0.001 ... 10000000 m³	0.05...353146667.2 scf
Pulse value	0.001 ... 10000000 m³	0.05...353146667.2 scf
In steps of	0.0001 m³	0.005 scf
Pulse length	0.002 ... 2 s	

Temperature monitoring	R 1/2	1/2" NPT
Measuring range	-10...60 °C	14...140 °F
Display range	-24...74 °C	-11.2...165.2 °F
Resolution	0.2 °C	0.5 °F
Set point SP	-9.7...60 °C	14.6...140 °F
Reset point rP	-10...59.7 °C	14...139.4 °F
Analogue start point	-10...46 °C	14...114.8 °F
Analogue end point	4...60 °C	39.2...140 °F
In steps of	0.1 °C	0.1 °F
Accuracy [K]	± 0.5; (medium flow in the limit area of the flow measurement range)*	

Transmission type	COM2 (38.4 kBaud)	
IO-Link revision	11	
SDCI standard	IEC 61131-9 CDV	
Profiles	Digital Measuring Sensor (0x800A), Identification and Diagnosis (0x4000)	
SIO mode	yes	
Required master port type	A	
Process data analogue	8	
Process data binary	2	
Min. process cycle time	7.2 ms	
Model	Type of operation	DeviceID
M/80/IOL/15T/CC	default	02010010
M/80/IOL/15C/CC	default	02010012

*NPT model 15C is by default set to imperial units.

Technical Data : DN25 Process Connection -M/80/IOL/25T/CC & M/80/IOL/25C/CC

Product characteristics	
Number of inputs and outputs	Number of digital outputs: 2; Number of analogue outputs: 1
Process connection	threaded connection R 1 or 1" NPT
Parameter setting options	hysteresis / window; normally open / normally closed; current/pulse output; display can be rotated and switched off; Display unit; totaliser

Application		
Application	for industrial applications	
Media	compressed air and nitrogen	
Medium temperature	-10...60 °C	14...140 °F
Min. bursting pressure	64 bar	6,4 MPa
Pressure rating bar	16 bar	1,6 MPa
MAWP (for applications according to CRN)	10,5 bar	

Measuring/setting range - M/80/IOL/25T/CC			
Measuring range	14...3750 l/min	0,4...103,7 m/s	0,8...225 m³/h
Display range	0...4500 l/min	0...124,4 m/s	0...270 m³/h
Resolution	2 l/min	0,1 m/s	0,1 m³/h
Set point SP	32...3749 l/min	0,9...103,7 m/s	1,9...224,9 m³/h
Reset point rP	14...3730 l/min	0,4...103,2 m/s	0,8...223,8 m³/h
Analogue start point ASP	0...3000 l/min	0...83 m/s	0...180 m³/h
Analogue end point AEP	750...3750 l/min	20,7...103,7 m/s	45...225 m³/h
Low flow cut-off LFC	4...40 l/min	0,1...1,1 m/s	0,3...2,4 m³/h
In steps of	1 l/min	0,1 m/s	0,1 m³/h

Inputs / outputs	
Inputs	
Inputs	counter reset
Outputs	
Output signal	switching signal; analogue signal; pulse signal; IO-Link; (configurable)
Electrical design	PNP/NPN
Number of digital outputs	2
Output function	normally open / normally closed; (parameterisable)
Max. voltage drop switching output DC [V]	2,5
Permanent current rating of switching output DC [mA]	150; (per output)
Number of analogue outputs	1
Analogue current output [mA]	4...20; (scalable)
Max. load Ω	500
Pulse output	consumed quantity meter
Short-circuit protection	yes
Type of short-circuit protection	pulsed
Overload protection	yes

Electrical data	
Operating voltage [V]	18...30 DC; (to SELV/PELV)
Protection class	III
Reverse polarity protection	yes
Power-on delay time [s]	1

Pressure monitoring	R 1	1" NPT
Measuring range	-1...16 bar	-15 ... 232 psi
Display range	-1...20 bar	-15 ... 290 psi
Resolution	0,05 bar	1 psi
Set point SP	-0,92...16 bar	-13 ... 232 psi
Reset point rP	-1...15,92 bar	-15 ... 231 psi
Analogue start point	-1...12,8 bar	-15 ... 186 psi
Analogue end point	2,2...16 bar	32 ... 232 psi
In steps of	0,01 bar	1 psi
Repeatability (% of the final value)	± 0,2	
Characteristics deviation 1% (of the final value)	< ± 0,5; (BFSL = Best Fit Straight Line)	
Greatest TEMPCO of the span (% MEW / 10 KJ)	± 0,3	
Greatest TEMPCO of the zero point (% MEW / 10 KI)	± 0,1	

Measuring/setting range - M/80/IOL/25C/CC *			
Measuring range	25...7945 scfh	0,4...132,4 scfm	12...340,2 ft/s
Display range	0...9535 scfh	0...158,9 scfm	0...408,2 ft/s
Resolution	5 scfh	0,1 scfm	0,2 ft/s
Set point SP	69...7943 scfh	1,1...132,4 scfm	3...340,1 ft/s
Reset point rP	30...7904 scfh	0,5...131,7 scfm	1,3...338,4 ft/s
Analogue start point ASP	0...6357 scfh	0...105,9 scfm	0...272,2 ft/s
Analogue end point AEP	1589...7946 scfh	26,5...132,4 scfm	68...340,2 ft/s
Low flow cut-off LFC	9...85 scfh	0,2...1,4 scfm	0,4...3,6 ft/s
In steps of	1 scfh	0,1 scfm	0,1 ft/s

Volumetric flow quantity monitoring	R 1	1" NPT
Measuring range	0...100000000 m³	0...353146667,2 scf
Display range	0...100000000 m³	0...353146667,2 scf
Set point SP	0,001...10000000 m³	0,05...353146667,2 scf
Pulse value	0,001...10000000 m³	0,05...353146667,2 scf
In steps of	0,0001 m³	0,005 scf
Pulse length	0,007...2 s	

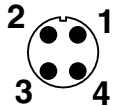
Temperature monitoring	R 1	1" NPT
Measuring range	-10...60 °C	14...140 °F
Display range	-24...74 °C	-11,2...165,2 °F
Resolution	0,2 °C	0,5 °F
Set point SP	-9,7...60 °C	14,6...140 °F
Reset point rP	-10...59,7 °C	14...139,4 °F
Analogue start point	-10...46 °C	14...114,8 °F
Analogue end point	4...60 °C	39,2...140 °F
In steps of	0,1 °C	0,1 °F

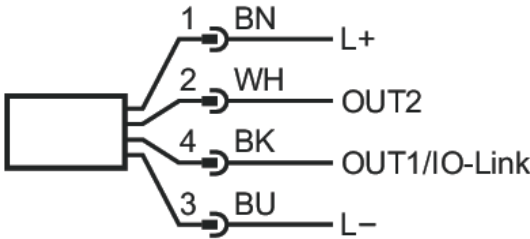
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision	11	
SDCI standard	IEC 61131-9 CDV	
Profiles	Digital Measuring Sensor (0x800A), Identification and Diagnosis (0x4000)	
SIO mode	yes	
Required master port type	A	
Process data analogue	8	
Process data binary	2	
Min. process cycle time	7,2 ms	
Model	Type of operation	DeviceID
M/80/IOL/25T/CC	default	02010011
M/80/IOL/25C/CC	default	02010013

* NPT model 25C is by default set to imperial units.

Port size	Nominal width	Flow range	Pressure range	Temperature range	Flow rate	Model
R1/2	15	4 ...1250 l/min 8...2648 scfh	-1 ... 16 bar -15 ... 232 psi	-10 ...60°C 14...140 °F	0 ...1000000000 m ³ 0...353146667.2 scf	M/80/IOL/15T/CC
R1	25	14... 3750 l/min 25...7945 scfh				M/80/IOL/25T/CC
1/2" NPT	15	4 ...1250 l/min 8...2648 scfh				M/80/IOL/15C/CC
1" NPT	25	14... 3750 l/min 25...7945 scfh				M/80/IOL/25C/CC

Electrical connection M12 x 1 Coding A

	PIN-No.	Signal	Cable
	1	L+	brown
	2	Out 2	white
	3	Out 1/ IO-Link	black
	4	L-	blue



Option selector

Process connection	Substitute
DN 15	15
DN 25	25

M80/IOL/★ ★ ★/CC

M12 connector	CC
Thread	Substitute
R1/2 or R1	T
1/2" NPT or 1" NPT	C

Accessories

Connector Cables

Product Description	Model
Cable 5 Pin A-coded M12 - M12 x 0.6 metre long	NC-125FS-125MS-A
Cable 5 Pin A-coded M12 - M12 x 1 metre long	NC-125FS-125MS-1
Cable 5 Pin A-coded M12 - M12 x 2 metre long	NC-125FS-125MS-2
Cable 5 Pin A-coded M12 - M12 x 5 metre long	NC-125FS-125MS-5
Cable 5 Pin A-coded M12 - Open End x 5 metre long	NC-125FS-00000-5

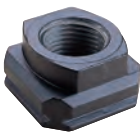
IO-Link Masters

Product Description	Model
PROFINET IO-Link Master	Port Class A (4x) + Port Class B (4x) NC-MP-4A4B-12DLA
EtherNet/IP IO-Link Master	Port Class A (4x) + Port Class B (4x) NC-ME-4A4B-12DLA

Quikclamp for air preparation unit

Quikclamp	Quikclamp with bracket assembled
	
840014-51KIT	840014-52KIT

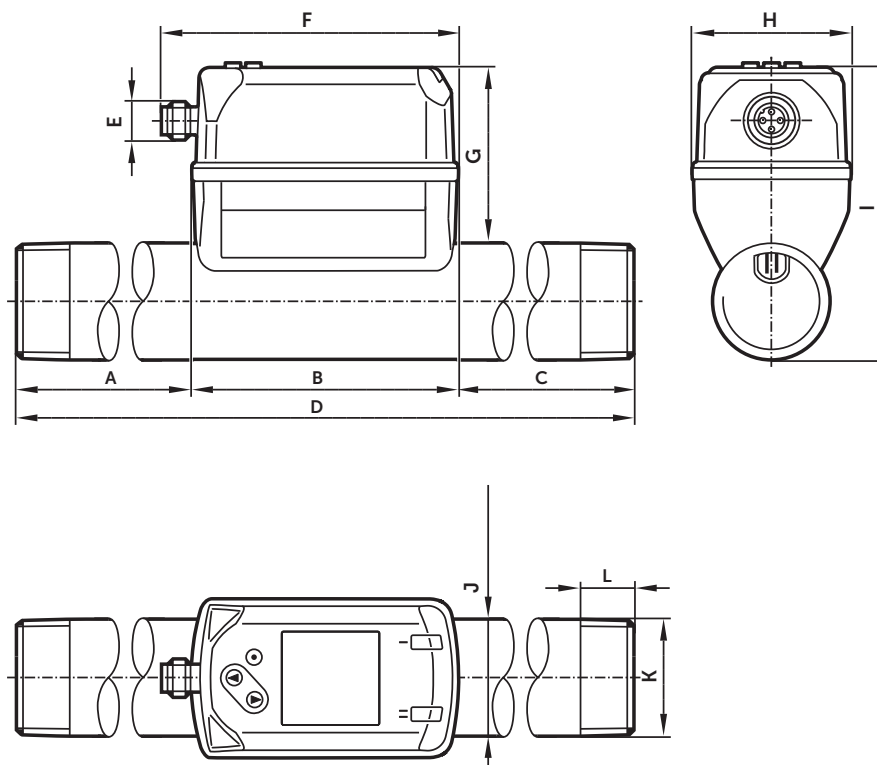
Port Adaptor for air preparation units

Port Adaptor

G 1/2 * 840015-11KIT

Note: Please use an appropriate thread sealant.

Dimensions

Dimensions in mm
Projection/First angle



A	B	C	D	E	F	G	H	I	J	K	L	Weight	Model
72	76.1	152	300	M12x1	85.1	49.9	45.4	71.2	Ø21,3	R 1/2	13.2	728,5 g (1.6060 lb)	M/80/IOL/15T/CC
72	76.1	152	300	M12x1	85.1	49.9	45.4	71.2	Ø21,3	1/2 NPT	19.9	731 g (1.6115 lb)	M/80/IOL/15C/CC
82	76.1	317	475	M12x1	85.1	49.4	45.4	83.1	Ø33,7	R 1	16.8	1598.5 g (3.5229 lb)	M/80/IOL/25T/CC
82	76.1	317	475	M12x1	85.1	49.4	45.4	83.1	Ø33,7	1 NPT	25	1581 g (3.4855 lb)	M/80/IOL/25C/CC

Warning

These products are intended for use in industrial compressed air and fluid systems only. Do not use these products where pressures and temperatures can exceed those listed under »Technical features/data«. Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren GmbH.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure. System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.