NORGREN

Operation Manual

VP50 IO-Link

Before starting work read these instructions.

IMI

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1.0 General

1.1 Information about these instructions

These instructions will enable you to safely install, set up and operate the VP50 IO-Link electro-pneumatic converter. These instructions are an integral part of the product and must be accessible to personnel. Personnel must carefully read through and understand these instructions before starting work of any kind on the valves. Following all of the safety and handling instructions contained in this manual is a fundamental requirement for safe working.

1.2 Explanation of symbols safety notice

DANGER
This symbol and the word ‚danger' indicates an immediately dangerous situation that may result in death or serious injury if not avoided.

WARNING!
This symbol and the word 'warning' indicates a potentially dangerous situation that may result in death or serious injury if not avoided.

CAUTION!
This combination of symbol and signal word indicates a possibly hazardous situation that may result in damage to property or environmental damage if it is not avoided.

Indicates tips and other useful information.

Other symbols

The following symbols are used to emphasise instructions, outcomes, lists, references and other elements in these instructions.

Symbols	Meaning
1., 2., 3.,	Step-by-step instructions
•	Lists with no specific order

1.3 Liability and warranty

Physical modification to the VP50 IO-Link converter may only be carried out by the manufacturer's personnel. If the converter requires repairs or servicing beyond the scope of the activities described in these instructions, this work may only be carried out by the manufacturer of the converter or by persons who have been expressly authorised and trained by the Manufacturer. Failure to observe the above will void the warranty. The manufacturer accepts no liability for damages incurred.

1.4 Warranty statement

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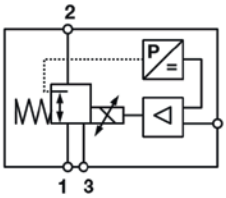
2.0 Specifications

The factory set performance ranges for the valve also appear on the rating plate of the specific unit.

2.1 Technical Data

Schematic

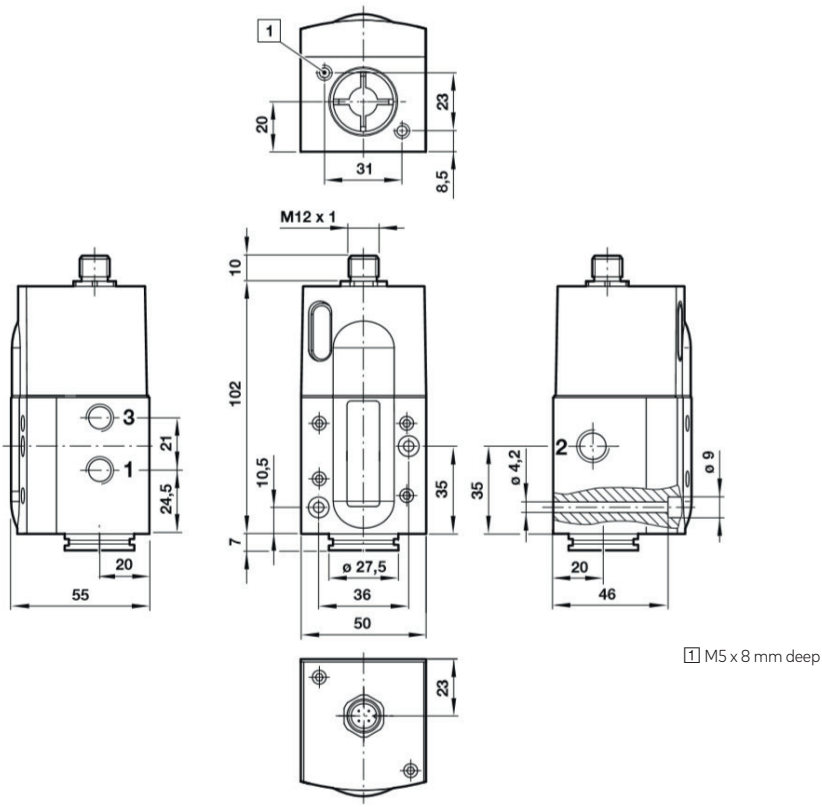


Specification	Value
Medium:	Oil free, dry media, min filtered to 5µm;
Output Pressure:	0 ... 2 bar 0 ... 6 bar 0 ... 10 bar
Supply Pressure:	Minimum 1.5 bar (29 psi) above maximum output required. Standard units: 12 bar Max. (174 psi)
Flow Capacity:	Up to 1000 Nl/min
Air Consumption	< 5 Nl/min
Linearity (independant):	<±1.0% of span
Hysteresis & Deadband:	<±1.0% of span
Response Time:	< 100ms (10-90% of output pressure into a 0,1 litre load).
Port Size:	All ports: G1/4, ¼ NPT or Manifold mount
Operating temperature:	0 ... +60°C (+32 ...140°F) Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).
Temperature Sensitivity:	Typically <0.1% span/oC between 0 ... +60°C (+32 ... 140°F)
I.P. Rating	IP65, with LED cover fitted.
Vibration Effect	<3% of span, 3g sine, 10 to 150Hz (3 axes).
Materials:	**Body:** Aluminium, Gafon and Zinc Diecasting **Diaphragms:** NBR **Coatings:** PTFE, Soft Anodising, Black polyester powder coating

Electrical Parameters

Specification	Value
Control Signal:	IO-Link
Power Supply:	24V d.c. ±25%
Power Consumption:	Typically <0.5W
Insulation Resistance:	10MΩ d.c.
Connection:	M12x1, 5 pin connector
Max. Cable Length	20 metres
Failure Mode:	Pressure falls to below 15mbar within 1s when power supply is lost

Dimensions



1 M5 x 8 mm deep

3.0 Features

- Closed-loop air piloted proportional control valve
- IO-Link communications
- Fast Response time
- Low Power consumption
- Output Pressure Feedback
- High visibility LED status light
- Manifold mountable
- RoHS compliant
- CE marked

3.1 General Description

The VP50 IO-Link is a digital proportional control valve using the IO-Link communications protocol to both control the valve output pressure but also provide feedback to the user system.

The pneumatic section is a diaphragm actuated glandless spool valve. Pilot pressure applied to the diaphragm moves the spool and regulates the output pressure of the unit. The pilot pressure is developed by a voice-coil pilot (I/P) which is controlled electronically by the onboard PCB.

The IO-Link communication protocol allows the user to not only control the output of the device but also adjust operating parameters and monitor various performance feedbacks, such as current output pressure and cycle count.

3.2 Electrical Connections

The unit must be connected by a qualified individual. The national and international regulations for the installation of electrical equipment must be adhered to.

▸ Ensure power is isolated.

▸ Connect the unit as follows:

Pin	Colour (typ.)	Connection
1	Brown	Power input (24 VDC ±25%)
2	n/a	-
3	Blue	Power ground (-V)
4	Black	Signal (C/Q)
5	n/a	-

Chassis Earth connection should always be connected to deliver optimum continuous EMC performance.

3.3 Pneumatic Connections

These instruments are recommended for use with clean, dry, oil free instrument grade air to BS 6739 or ISA-7.0.01-1996

Dew Point: At least 10°C (18°F) below anticipated ambient temperature.

Dust: Filtered to below 5 microns

Oil Content: Not to exceed 1ppm mass.

The inlet and outlet ports are threaded G1/4 or 1/4"NPT female and suitable fitting should be used. For most installations 1/4" (6mm) pipe will be adequate. Always ensure that the downstream volume between the output of the VP50 and the actuator/device is between 100cc and 2000cc.

If the air supply is not of adequate quality this can normally be achieved by the use of an air filter regulator. In all cases, purge the supply pipework before connection to the valve.

The use of a soft setting anaerobic seal is recommended, (e.g. Loctite Hydraulic Seal 542). Always follow the sealent manufacturer's recommendations during use.

Under no circumstances should PTFE tape be used for sealing the fittings as this tends to shred small particles which may contaminate the instrument and cause malfunctions.

4.0 IO-Link General Information

This unit has an IO-Link communication interface which requires an IO-Link-capable module (IO-Link master) for operation. The IO-Link interface enables direct access to the process and diagnostic data and provides the possibility to set the parameters of the unit during operation. In addition communication is possible via a point-to-point connection with a USB adapter cable.

Device-specific Information You can find the IODDs necessary for the configuration of the IO-Link unit and detailed information about process data structure, Diagnostic information and parameter addresses at www.norgren.com

4.1 User Settings

User Adjustable Setting	Description
Set Zero calibration adjustment	+/- 5% of Span
Set Span calibration adjustment	+/- 5% of Span
Reset to Factory Setting	Resets all user settings to Factory supplied.
Communications Failure Mode	Configuration of fail to zero (default) or fail freeze in the event of IO-Link communications failure
PID	Adjustment of the Gain settings within the control algorithm. These settings should only be altered by experienced personnel
Set Pressure units	Select demand/feedback pressure unit. PSI,Bar,kPa,Kgcm2,Atms
Pressure Ramp profile	Preset unit response time adjustment
Displayed pressure damping	Applies moving average to displayed pressure output

Read Only Parameters	Description
Demand Cycle Count	Number of pressure operations totalling 10% of Span
Total Hours	Total hours unit has been powered since manufacture
Current Power On Hours	Total hours since last power cycle
Internal Temperature feedback	ºC reading of internal temperature. For indication only.
Total Error Count	Total number of error events

4.2 Diagnostic Indicators

LED Status	Description
Green Off	No power
Green Solid	Power OK
Green Flashing	IO-Link Communications established
Red On	* Refer to error table below

Error Event Code	Detailed Device Status	Fault Description	Recommendation
0x5000	Device hardware fault	Internal hardware fault	Cycle power to unit. If error remains contact Technical Support
0x183A	IOLink PHY chip fault	IO-Link hardware fault	Check power supply voltage is within specification
0x6320	Parameter error	Demanded pressure outside of unit specification	Check demanded pressure is achievable.

5.0 Declaration of Conformity

The current EMC Declaration of Conformity can now be found on the Norgren Ltd website, along with all other product documentation.

Please visit: https://www.imi-precision.com/uk/en/technical-support

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The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of exercising judgement and verification. It must be remembered that our products are subject to a natural process of wear and ageing.

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