NORGREN

Operation & Service Manual

VP60

Before starting work read these instructions.

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1. Description

The VP60 is a 5/3 way proportional valve, nominal diameter 8.

It is a bidirectional linearised throttle, and allows, for instance, continuous, reversible speed control for doubleacting cylinders or reversible pneumatic motors. (see data sheet).

2. Type code

VP6010L xxx1 x B200

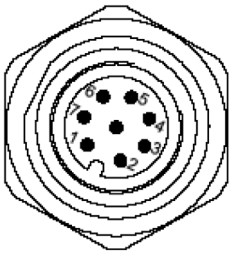
Pneumatic port	Substitute
G1/4	**J**
1/4 NPT	**K**
ISO1	**T**
Input	**Substitute**
4 bis 20mA	**4**
-5 V bis + 5 V differentiall	**6**
0 bis + 10 V differentiall	**7**
Profibus DP	**P**

Option	Substitute
Serielle Schnittstelle RS 232	**B200**
Connector type	**Substitute**
M12/8 pol.	**M**
Feldbus spez.	**N**
Output	**Substitute**
0 bis 10V/4-20 mA	**6**
Profibus DP	**P**

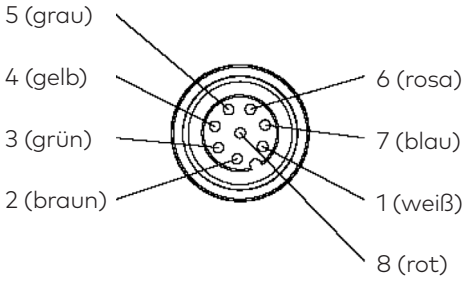
3. Electrical connection

The VP60 has a voltage supply, two analogue inputs and outputs, and one digital output. They are consolidated in an 8-pin M12 plug connector:

Plug:



Cable::



3.1. Pining

Pin	Colour	Description	Operating principle
1	white	Iin	Setpoint input current 4..20mA (500 working resistance to GND)
2	brown	Error	Error output (current limited 15mA to Ub)
3	green	-Ud	Setpoint input, voltage difference to reference potential
4	yellow	+Ud	Setpoint input, voltage difference signal 0..10V / ± 5V
5	grey	Iout	Current output actual value 4..20mA to Ub
6	pink	Ub	Supply voltage 24V
7	blue	GND	Supply earth GND
8	red	Uout	Voltage output actual value 0..10V (relative to GND)

3.2. Voltage supply

The valve must be operated on a 24V supply with grid protection (PELV per EN 60204-1, DIN VDE 0100-410, IEC 364-4-41, HD 384.)4.41 S2, EN 60079-14). Maximum voltage must be less than 32V.

The plug must not be separated from the valve while under voltage.

3.3. Screening

Should an accessory cable not listed in the data sheet be used, a screened cable is to be deployed to avoid interference (noise) from electric fields. The screening is to be connected to the PE on the plant side (see connection diagram).

3.4. Line laying

Supply and signal lines may not be laid parallel to high current or high voltage lines.

Cable cross-sections in accordance with VDE 01134 (Assoc. of German Elect. Engineers regulation 01134)

4. Pneumatic connection

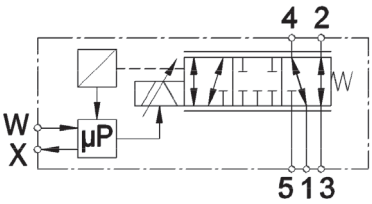
Connection 1: System pressure

Connection 2: Working port

Connection 3: Exhaust for working port 2

Connection 4: Working port

Connection 5: Exhaust for working port 4



4.1. Operating pressure

It must be ensured that the maximum inlet pressure of 16 bar (see technical data) is not exceeded.

4.2. Recommended installation

- Installation of a 3Jm filter ahead of port 1 is highly recommended.
- In order to ensure constant linearity of the VP60 even under high flow, lines and any existing valves should have a nominal diameter greater than the VP60 (NG8) and be made as short as possible.
- For dynamic applications, installation of a buffer volume on the pressure side, between the filter and port 1, is advisable. It should have the same volume as the working actuator.
- Before connecting the VP60, all lines should be cleared of residue, for instance by blowing them out.
- For moving installation points, the valve should be installed as close as possible to orthogonal to the main direction of motion.
- The VP60 can be installed in any orientation. The preferred orientation, however, is vertical, with the solenoid on top (minimises thermal loading of the electronics, and mechanical forces on the slider).

4.3. Line cross section

Inlet line at port 1 should be larger than the nominal valve diameter if possible (>DN8).

Working line on 2 and 4 preferably equal to, or greater than, the valve nominal diameter.

Air at the venting connections 3 and 5 must be led off free from pressure. Line cross sections and lengths have an influence on the application (buffer volume, pressure drop)

5. General notes on repairs and service

Do not attempt to carry out repairs on your own.

After repairs, factory setting and testing measures are necessary.

Please return the device to the manufacturer.

Date Code, 5-digit: Digits 1-2: Year of production; 2001 = A1, 2002 = A2, ...;
3-4: Week of production (calendar week);
5: Day of production;

Overseas:

The sales companies responsible will forward the equipment to the manufacturer.

Please include a description of the fault you have ascertained with the equipment you are returning. The type and serial number of the equipment, as well as customer-specific parameterisation of the device, must always be stated.

6. Transport, storage, delivered state, cleaning

Transport and storage is only permitted in the original Norgren packaging.

This ensures protection against mechanical damage. The valves are delivered ready for operational use.

They are ready-to-operate immediately once correctly connected.

Should internal cleaning be necessary, sending the equipment to the manufacturer is recommended.

7. Failure description and potential remedis

Error/failure	Possible cause	Action/remedy
Output flow too small or not proportional	• Connection cross section too small	•Check and enlarge if necessary
Maximum flow only	•Supply voltage is missing	•Measure at pins 6+7
No output flow	•There is not set point •Supply pressure is missing •Pneumatic connections are blocked •Pneumatics connected incorrectly	•Measure (pin depends on setpoint type) •Check •Check •Check with wiring diagram
Flow fluctuations	•Supply pressure is fluctuating	•Measure
Flow remains the same when set point is changed	•Dirt in the valve	•Check the filtering (5 µm) •Send in the unit for examination
Too slow to achieve output flow	•Using lubricated compressed air with poor viscosity or additives •Contamination in the valve leads to increased friction and delayed reaction	•Use unlubricated compressed air or install a oil separator •Examine Filter
Erratic change in the output flow	•Glitches on the voltage supply or set point •Cable screen is missing or connector incorrectly	•Measure •Use screened cable and earth on the plant side
Flow allocation at de middle position not o.k. (only leakage normal)	•Connection is missing when using differential input between analogue GND and Power GND	•Check
EMC interference on differential set point	•When using the differential set point, pulse spikes are greater than the common mode rejection	•Create a connection between pin 3 W(-Ud) and pin 6 GND on the customer's supply voltage output

8.General safety notes / intended use

These products are intended solely for use in industrial pneumatic systems. In these situations they are only to be utilised where the pressure and temperature values given under "**Technical data**" are not exceeded. Please contact Norgren directly before using the products in non-industrial applications, or in life-support or other systems that are not included in the published instruction documentation.

Components used in pneumatic systems can fail in various ways as a result of misuse, wear or faults. System designers are strongly recommended to take into account the possible failure modes of all components used in pneumatic systems, and to take adequate safety precautions to prevent personal injury or equipment damage in the event of such a failure.

It is the responsibility of system designers to include safety instructions for the end user in the operating manual if there is insufficient protection in the event of failure.

System designers and end users are strongly recommended to comply with the safety regulations included with the products.

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