Drive Electronics pQ11

OBSOLETE DOCUMENT
Technical Reference Only

Plug-in type amplifier with constant current controller for proportional valves

- **Control of one solenoid**
- **Easy mounting directly on valve body**
- **Standard voltage and current signals for setpoint**
- **Control from computer also possible**
- **Impressed solenoid current, thus no change in the control variable due to environmental influences (e. g. temperatures and main fluctuations)**
- **Plug-in type connection for proportional solenoid with contact arrangement according to DIN 43650, type A or B**
- **Supply via connector according to DIN 43651 or cable, 2 m long**

Technical data

Mounting position:
Any position
Operating temperature:
0 to +50˚C
Weight:
0,18 kg
Protection class:
IP 65 (plugged-in and mounted)
Electrical connection:
Cable 2 m 6 x 0,5mm^2 + PE, screened
alternatively:
6polig + PE connector according to DIN 43651

Electromagnetic Compatibility
The control logic conforms to the EC requirements EN50081-2 (emission) and EN50082-2 (disturbance noise). For this specification shielded cables have to be used.

Ordering information

Drive electronics for proportional valve, output current 0 to 1000 mA, with connector according to DIN 43651
Type: 5980083

Our policy is one of continuous research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

General information

Type	Version	Output currents * (mA)	Solenoid connection Contact arrangement to DIN 43650 Form A (wide)	Form B (narrow)	Type of connection Cable 2m	Connector to DIN 43651	Dimensional drawing Nr.	Drive electronics for valve
5980081**	0 to 2400mA	0 to 1600/2400	•	–	–	•	01	4088XXX VP40 ND 4, 6, 8
5980085			•	–	•	–	02	(data sheet 6.6.022)
5980118 **			–	•	–	•	01	4090022 VP40 ND 2
5980119			–	•	•	–	02	(data sheet 6.6.020)
5980082 **	0 to 1000mA	0 to 400/800/1000	•	–	–	•	01	
5980086			•	–	•	–	02	
5980083 **			–	•	–	•	01	4090020 and 4090021 VP40 ND 2
5980087			–	•	•	–	02	(data sheet 6.6.020)

* Internally switchable
** Cable plug to be ordered separately (type: 0660689)
- Not available
• Standard

Electrical information

Supply with residual ripple ≤ 10% (U_B)	18 to 32 V DC				
	Version (for more details see table above)				
	0 to 1000 mA			0 to 2400 mA	
Output current for solenoid * (mA)	0 to 400	0 to 1600	0 to 1000	0 to 1600	0 to 2400
Current consumption, plug-in type amplifier (mA)	400	700	800	1400	2200
Solenoid resistance R_{20} (Ω)	2,5 to 28	2,5 to 14	2,5 to 11	2,5 to 7	2,5 to 4,5
Output for supply of set point adjuster	15V, 3mA				
Zero-point adjustment (selectable via jumper)					
Zero-point shift (offset) at setpoint w = 0	0 to 30% $I_A$max				
or					
Zero point jump with setpoint w ≥ 2%	0 to 30% $I_A$max				
Drive limitation	0 to 100% $I_A$max				
Supperimposed dither (amplitude)	0 to 30% $I_A$max				
Dither frequency (internally selectable)	40/80 Hz				
Ramp shaper adjustment time (selectable via jumper)					
Valid for rising or falling ramp					
Ramp off	< 2 ** [ms]				
Ramp on	approx. 0,18 to 18 s **				
Setpoint w (selectable via jumper)					
Voltage input	Setpoint U_E	0 to 10 V			
	Input resistance R_i	>330 kΩ			
Current input	Setpoint I_E	0 to 20 mA			
	Setpoint I_E	4 to 20 mA			
	Input resistance R_i	<135 Ω			

* Selectable via jumper
** With stepwise change of setpoint Δw = 100%

Accessories

Type	Description	Specification
0660689	Connector (for amplifier 5980081, 5980082, 5980083 and 5980118)	6pin + PE DIN 43651

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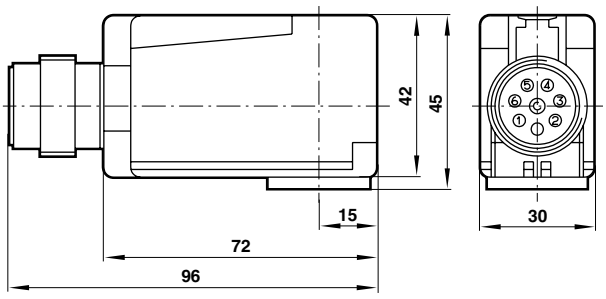
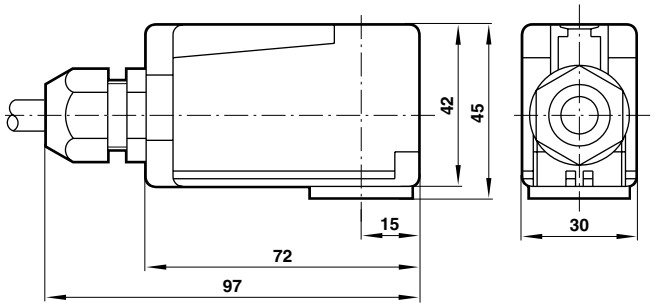
General dimensions

01 With connector according to DIN 43651

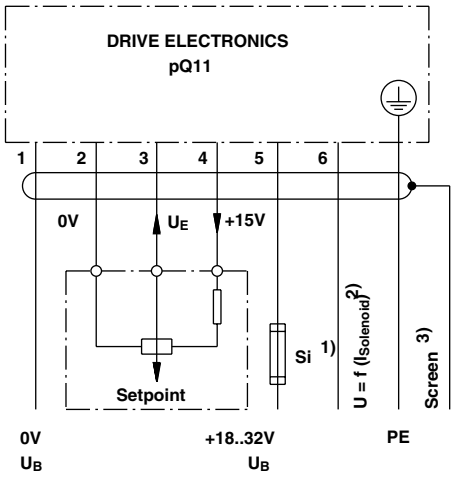


02 With cable

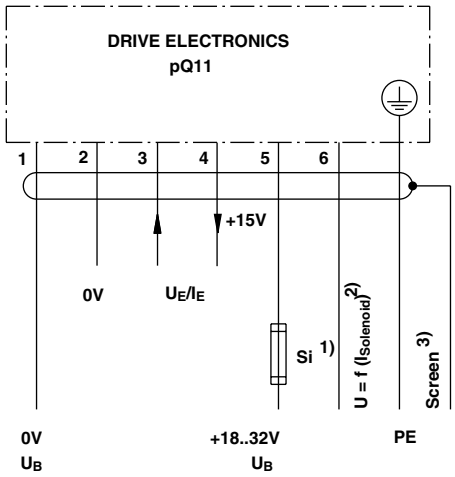


Connection diagrams

With connector according to DIN 43651



Setpoint adjuster potentiometer



Setpoint adjustment: 0..10V
0..20mA
4..20mA

1) Recommended fuse: MT 1.0 A for amplifier **5980082, 5980083, 5980086** and **5980087**
MT 2.5 A for amplifier **5980081, 5980085, 5980118** and **5980119**

2) **Definition** U = f ($I_{solenoid}$)

Version	Assignment	Measured value (measured against MP1)
0 ... 1000 mA	1 mV corresp. to. 3 mA	0 ... 325 mV
0 ... 2400 mA	1 mV corresp. to 10 mA	0 ... 240 mV

3) Screen connection: setpoint of 0 V

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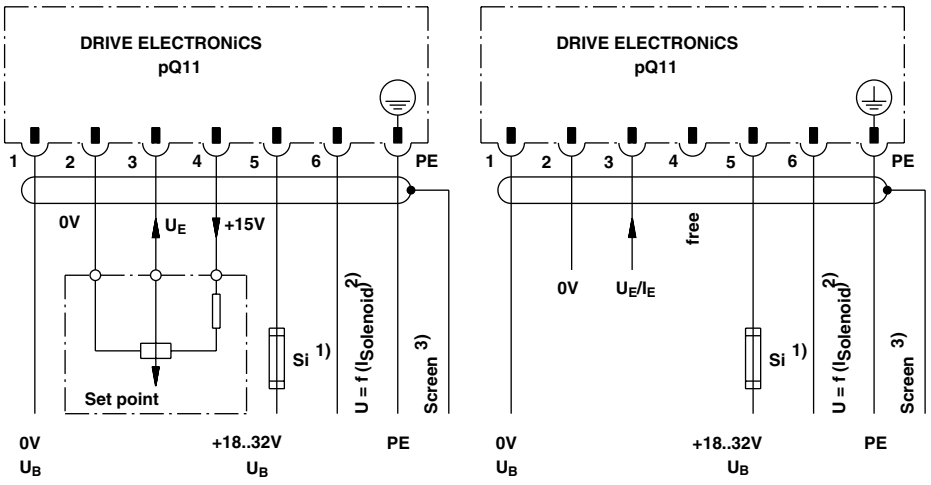
Connection diagrams

With cable



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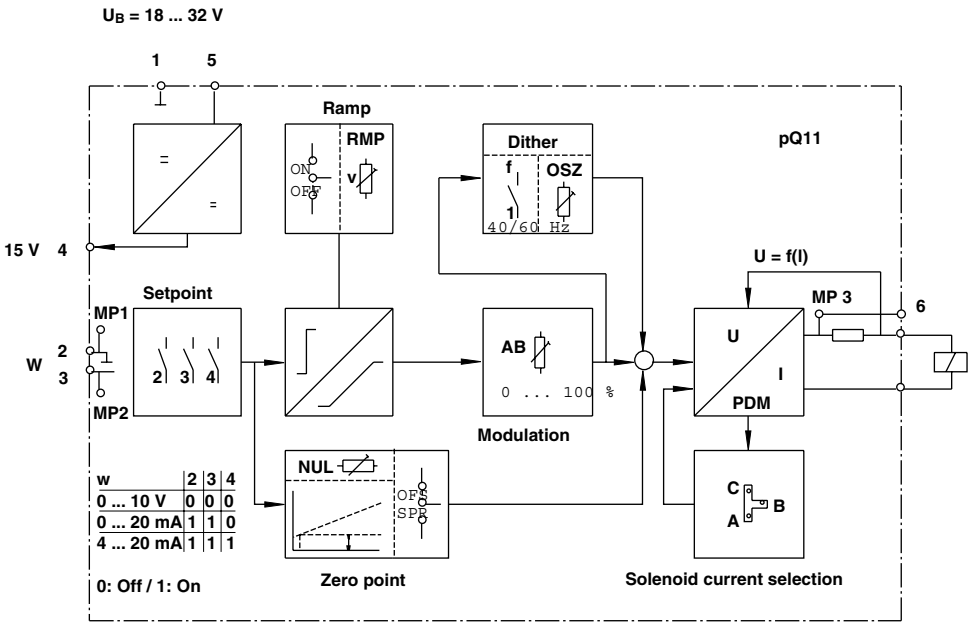
3) Screen connection: setpoint of 0 V

Description of function:
Block diagram



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Definitions

Drive limitation „A B“ (Fig. 1)

If the customer-specific working range repesents only part of the valve adjustment range, the trimming potentiometer „A B“ can be used to match the working range to the full setpoint signal from 0 to 100%. This provides the possibility of assignment a defined pressure or a defined flow volume to the end point in order to obtain greater resolution.

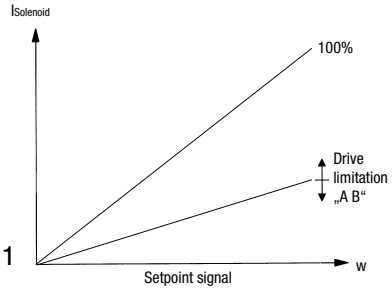

Fig. 1

Zero point

Via a potentiometer the solenoid current can be increased. This is possible in two ways. For the selection use jumper D2 according to the installation instructions.

Zero-shift (Fig. 2)

Via the trimming potentiometer „NUL“ the solenoid current can be increased. This provides the possibility of assigning a defined pressure or defined flow volume to the start point (setpoint = 0).

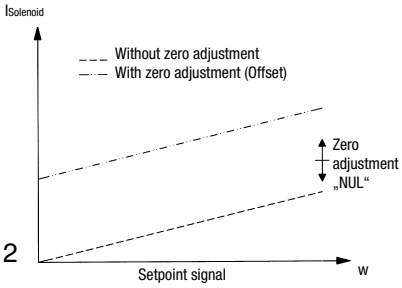

Fig. 2

Zero-step function (Fig. 3)

By means of the zero-step function, valve overlapping can be eliminated. As soon as the setpoint adjustment is exceeded by more than 2% the solenoid current is raised corresponding to the adjustment of the trimming potentiometer „NUL“. This way it is assured that with setpoint = 0 the solenoid current is 0 mA.

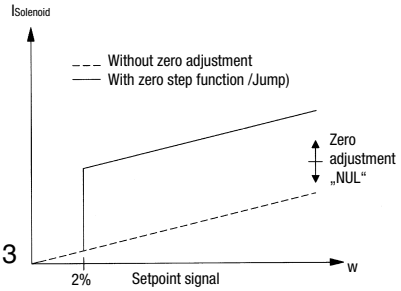

Fig. 3

Ramp shaper (Fig. 4)
Trimming potentiometer F2 „RMP“

The ramp module provides a ramp-like change of the solenoid current if the set point changes abruptly. The final value of the solenoid current thereby corresponds to the set point. The adjustment time between two working points can be adjusted, measured with a setpoint change of 100%. The ramp shaper is switched off with the jumper F1 (refer to installation instructions).

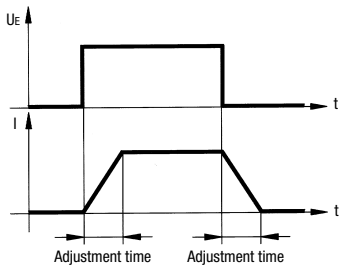

Fig. 4

Dither amplitude (Fig. 5)
Trimming potentiometer "OSZ"

In order to improve the hysteresis characteristics in a valve, static friction on the valve piston must be avoided. This is achieved by superimposing a dither signal on the valve current. Via the trimming potentiometer „OSZ“ the amplitude of the superimposed current can be adjusted within the range of 0 to 30% of the rated current. Optimum setting is achieved when small changes in the setpoint are registered on the final control element. The minimum dither amplitude possible should be used at all times. The frequency can be switched on from 40 Hz to 80 Hz with the switch C1 (refer to installation instructions).

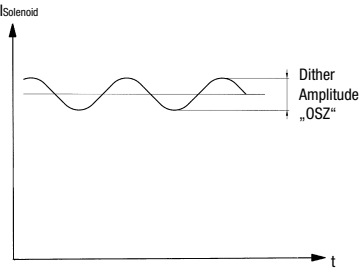

Fig. 5

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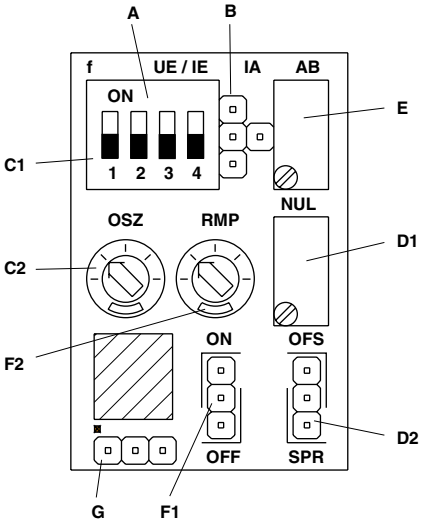
Installation instructions
View of the electronics

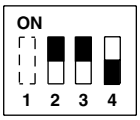
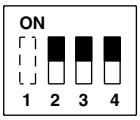


A Setpoint preselection
B Selection of solenoid current
C1 Super imposed dither (frequency)
C2 Super imposed dither (amplitude)
D1 Zero-point shift
D2 Zero-point function
E Modulation limitation
F1 Ramp on/off
F2 Ramp time
G Check points

Trimming potentiometer

Designation		Range adjustment Direction of rotation on potentiometer counterclockwise	clockwise	Basic setting factory adjusted
E Modulation limitation „AB“	(mA)	0	100 %	100 %
D1 Zero-point „NUL“	(% $I_{A\,max}$)	0	30	0
F2 Ramp „RMP“	ca. (s)	0,18	18	18
C2 Superimposed dither „OSZ“	(% $I_{A\,max}$)	0	30	15

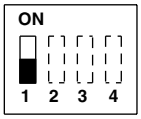
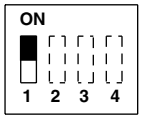
A Set point preselection

Setpoint	0 ... 10 V [1]	0 ... 20 mA	4 ... 20 mA
Switch positions			

B Selection of solenoid current

Version	0 ... 1000 mA			0 ... 2400 mA	
Output current - range (mA)	0 ... 400	0 ... 800	0 ... 1000	0 ... 1600	0 ... 2400
Jumpers	A  [1]	B 	C 	A  [1]	C 

C1 Superimposed dither

Frequency	40 Hz [1]	80 Hz
Switch positions		

[1] Factory adjusted

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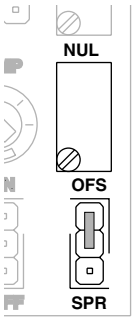
D2 Zero-point adjustment Jumper

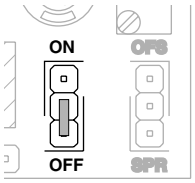
Zero-shift function	Position „OFS“ 1)
Zero-step function	Position „SPR“



F1 Ramp shaper Jumper

Ramp OFF	Position „OFF“ 1)
Ramp ON	Position „ON“

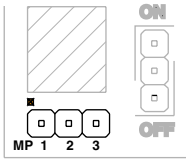
1) Factory adjusted



Check points

G Check points

MP1 = 0 V (reference potential)
MP2 = Setpoint
MP3 = Solenoid current



Definition

Setpoint	Measured value (measured against MP1)
0 ... 10 V	0 ... 10 V
0 ... 20 mA	0 ... 2 V
4 ... 20 mA	0,4 ... 2 V

Definition U = f ($I_{Solenoid}$)

Version	Assignment	Measured value (mesured against MP1)
0 ... 1000 mA	1 mV corresp. to 3 mA	0 ... 325 mV
0 ... 2400 mA	1 mV corresp. to 10 mA	0 ... 240 mV

Warning

These products are intended for use in industrial systems only. Do not use these products where *pressures* and *temperatures* can exceed those listed under **‘Technical 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.
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 a failure.
System designers must provide a warning to end users in the system instruction 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 where applicable.

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Instructions for electrical installation

1. Voltage supply
Voltage supply 18 ... 32 V (incl. residual ripple). Excess voltage may destroy the electronic system!

2. Avoidance of interferences

2.1 Screening
In order to prevent interferences by electric fields, screened lines must be used. The screen must be connected to PE (see circuit diagram)

2.2 Laying of cables
Supply and signalling lines shall not be laid in parallel to power mains or high-voltage lines.

3. Line cross section
According to VDE 01134.

Zero potentials
For zero potentials (0 V), the supply voltage and the setpoint signal, two separate wires must be used in order to prevent distortion of the setpoints.

General

Repairs and servicing

Do not attempt to repair the product by yourself.
After repair tasks, certain adjustments and test procedures have to be performed, which can only be done by qualified and authourised personnel. Products in need of repair may be sent to the following address:

IMI Norgren Herion Fluidtronic GmbH & Co. KG
Föhrenbachstraße1, D-73630 Remshalden

Tel.: +49 (0) 71 51 / 70 88 -0
Fax: +49 (0) 71 51 / 70 88 -55

Abroad:

Your local representative dealer or agent will forward the product to the manufacturer for repair.

Please indicate a description of the error, malfunction or failure with the product you send in for repair. You should always state the serial number and the purchase date.
For servicing and repairing the products, we can offer experienced and qualified personnel. In case you need our assistance, please contact the following address:

IMI Norgren Herion Fluidtronic GmbH & Co. KG
Föhrenbachstraße1, D-73630 Remshalden

Tel.: +49 (0) 71 51 / 70 88 -0
Fax: +49 (0) 71 51 / 70 88 -55

Abroad:

Your local representative dealer or agent.

Transport, storage, default setting, cleaning

The product can only be transported and stored in the original Norgren Herion packaging which ensures suitable protection against mechanical damage.
The product is shipped in a ready-to-operate-state (default settings). After correct installation, it is ready for use.
In case it is necessary to clean product, we recommend sending it back to the manufacturer. The correct address can be found under repairs and servicing.

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