

Proportional pressure relief valve, pilot operated, with inductive position transducer

RE 29141/07.05

1/12

Type DBEB10Z

Nominal size 10
 Unit series 1X
 Maximum working pressure A, B, X 315 bar, Y 2 bar
 Maximum flow rate Q_{nom} 120 l/min



Overview of Contents

Contents	Page
Features	1
Ordering data	2
Preferred types, symbol	2
Function, sectional diagram	3
Technical data	4
External trigger electronics	5 to 8
Characteristic curves	9
Unit dimensions	10

Features

- Pilot operated valves with position feedback for limiting system pressure (pilot oil internal only, with relief port X)
- Adjustable by means of the position of the armature against the compression spring
- With position control, minimum hysteresis < 1 %, see Technical Data
- Pressure limitation to a safe level even with faulty electronics (solenoid current $I > I_{max}$)
- For subplate attachment, mounting hole configuration to ISO 5781-AG-06-2-A
Subplates as per catalog sheet RE 45055 (order separately)
- Plug-in connector to DIN 43650-AM2 for the solenoid and plug-in connector for the position transducer, included in scope of delivery
- Data for the external trigger electronics
 - $U_B = 24 V_{nom}$ DC
 - Adjustment of valve curve N_p and gain with and without ramp generator
 - Europe card format, setpoint 0...+10 V (order separately)

Ordering data

DBEB10	Z	-1X/	XY	G24-	37	Z4	M	*
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Proportional pressure relief valve
NG10, pilot operated with position
transducer

Mounting hole configuration to
ISO 5781-AG-06-2-A

Unit series 10 to 19
(10 to 19: installation and connection
dimensions unchanged)

Max. pressure stage

up to 180 bar

up to 315 bar

Relief port X

External pilot oil discharge Y

Voltage supply of trigger electronics

24 V DC

= Z

= 1X

= 180

= 315

= XY

= G24

Further information in plain text

M = NBR seals, suitable
for mineral oils
(HL, HLP) to DIN 51524

Z4 = **Electrical connection**
Unit plug to DIN 43650-AM2
Plug-in connector included in
scope of delivery

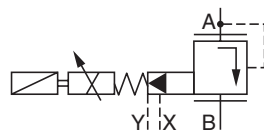
37 = **Solenoid type (current)**
Solenoid current 3.7 A max.

Preferred types

Solenoid 3.7 A	
Type	Material Number
DBEB10Z-1X/180XYG24-37Z4M	0 811 402 100
DBEB10Z-1X/315XYG24-37Z4M	0 811 402 101

Symbol

For external trigger electronics



Function, sectional diagram

General

Type DBEB10Z proportional pressure relief valves are pilot operated pressure relief valves used to limit system pressure. The valves are actuated by means of a proportional solenoid with position control, acting against a spring force at the cone. The valve body contains a logic element (poppet valve) of the “normally closed” type. This is pilot operated and is in conical seat design.

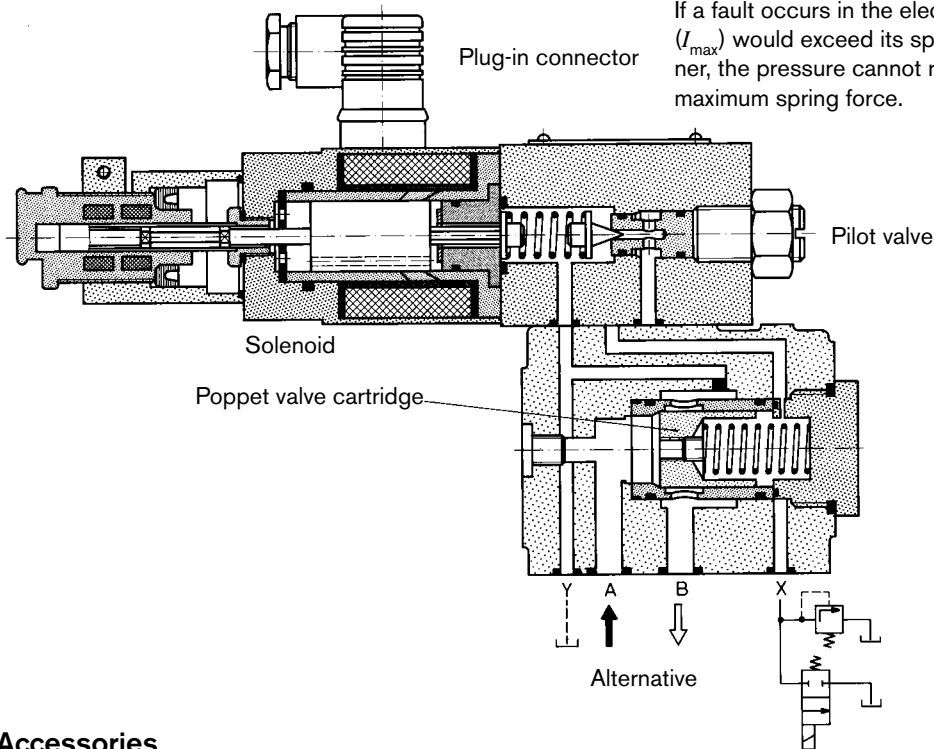
Basic principle

To adjust the system pressure, a setpoint is set in the trigger electronics. Based on this setpoint, the electronics control the position of the solenoid armature on the compression spring by means of the signal from the position transducer.





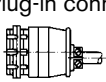
The position control ensures very low hysteresis. The pilot valve is supplied with pilot oil at a flow rate of < 0.8 l/min via a bore in the main stage. The spring force acting on the cone and the pressure in the valve seat balance one another. The “ p_{max} ” pressure stage is determined by the cone and seating bore configuration in the pilot valve.

Pressure limitation for maximum safety

If a fault occurs in the electronics, so that the solenoid current (I_{max}) would exceed its specified level in an uncontrolled manner, the pressure cannot rise above the level determined by the maximum spring force.



Accessories

Type		Material Number
(4 x)  ISO 4762-M10x80-10.9	Cheese-head bolts	2 910 151 309
Plug 	VT-VRPA1-537-10/V0/PV	RE 30052
Plug 	VT-VRPA1-537-10/V0/PV-RTP	RE 30054
Plug 	VT-VRPA1-537-10/V0/PV-RTS	RE 30056
Plug-in connectors  2P+PE	Plug-in connector 2P+PE (M16x1.5) for the solenoid and plug-in connector for the position transducer. Included in scope of delivery, see also RE 08008.	

Testing and service equipment

Test box type VT-PE-TB1, see RE 30063

Test adapter for Europe cards type VT-PA-3, see RE 30070

Technical data

General		
Construction	Pilot stage	Poppet valve
	Main stage	Pressure relief valve
	Valve cartridge	Poppet valve, normally closed, with pilot oil bore
Actuation		Proportional solenoid with position control, external amplifier
Connection type		Subplate, mounting hole configuration NG10 (ISO 5781-AG-06-2-A)
Mounting position		Optional
Ambient temperature range	°C	-20...+50
Weight	kg	9.5
Vibration resistance, test condition		Max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

Pressure fluid	Hydraulic oil to DIN 51524...535, other fluids after prior consultation	
Viscosity range,	recommended mm ² /s	20...100
	max. permitted mm ² /s	10...800
Pressure fluid temperature range	°C	-20...+80
Maximum permitted degree of contamination of pressure fluid Purity class to ISO 4406 (c)	Class 18/16/13 ¹⁾	
Direction of flow	See symbol	
Max. set pressure (at $Q_{min} = 1\text{ l/min}$)	bar	180 315
Minimum pressure (at $Q_{min} = 1\text{ l/min}$)	bar	6 8
Max. mechanical pressure limitation level, e.g. when solenoid current $I > I_{max}$	bar	< 190 < 325
Max. working pressure	bar	Port A, B: 315
		Port Y: ≤ 2 external pilot oil drain
		Port X: 315 relief port
Internal pilot oil flow	l/min	≤ 0.8
Max. flow	l/min	120 for Q_{max} , see characteristic curves

Electrical

Cyclic duration factor	%	100 %
Degree of protection	IP 65 to DIN 40050 and IEC 14434/5	
Solenoid connection	Unit plug DIN 43650/ISO 4400, M16x1.5 (2P+PE)	
Max. solenoid current	I_{max}	3.7 A
Coil resistance R_{20}	Ω	2.5
Max. power consumption at 100% load and operating temperature	VA	60

Static/Dynamic²⁾

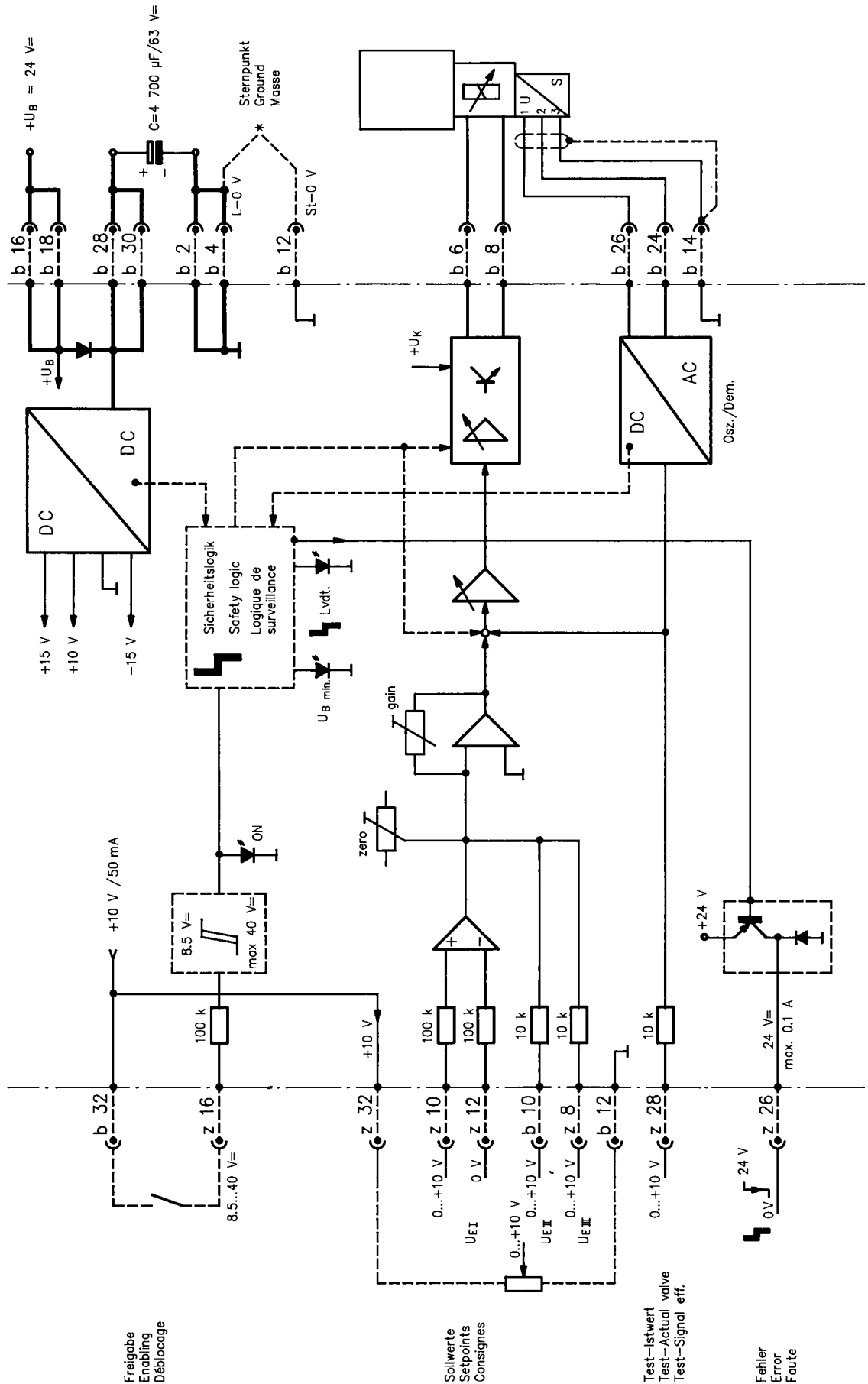
Hysteresis	%	≤ 1
Manufacturing tolerance for p_{max}	%	approx. 6
Response time 100% signal change	ms	≈ 80, dependent on dead volume or system volume

¹⁾ The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sheets RE 50070, RE 50076 and RE 50081.

²⁾ All characteristic values ascertained using amplifier 0 811 405 097 for the 3.7 A solenoid.

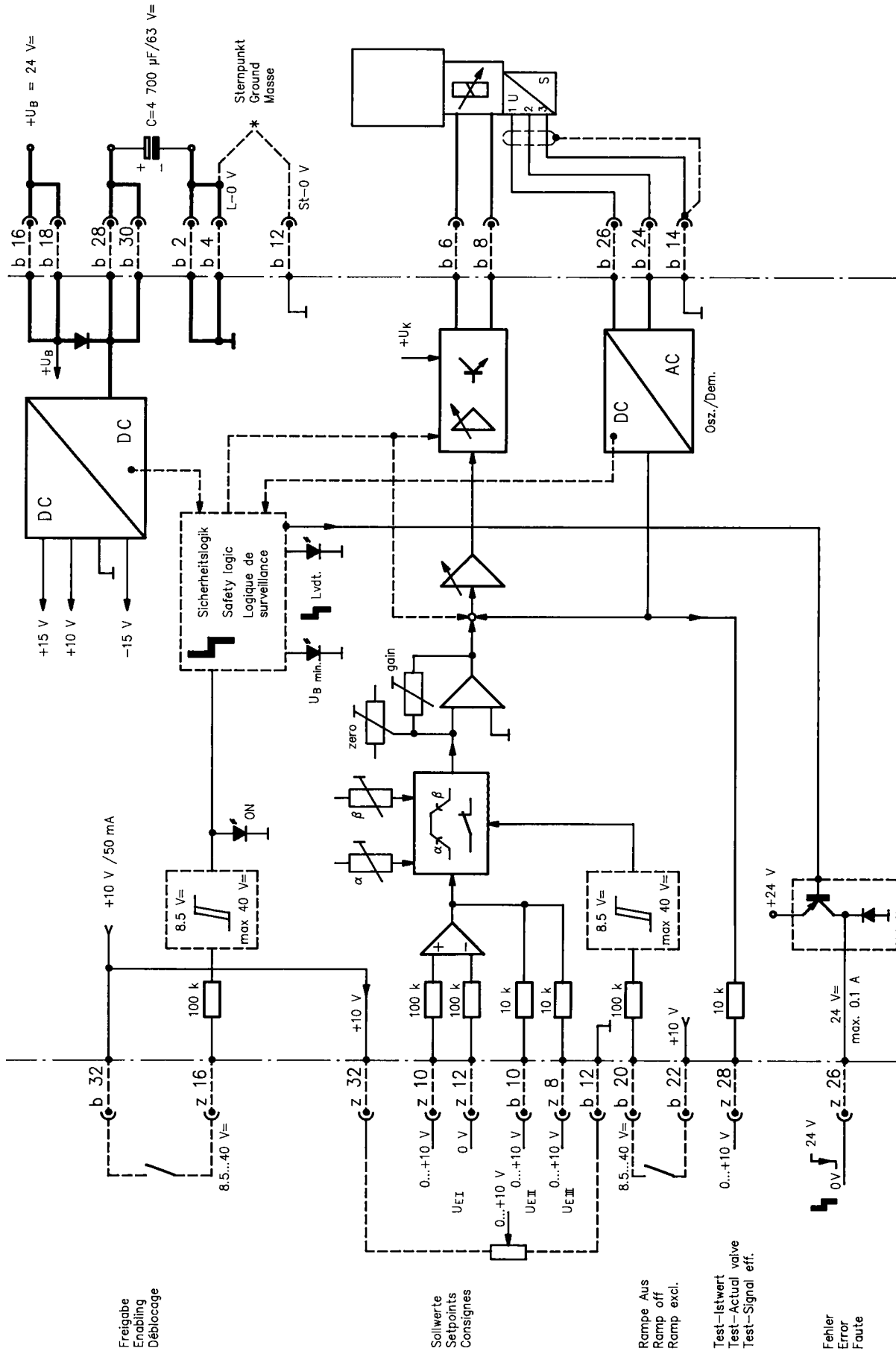
Valve with external trigger electronics (europe card without ramp, RE 30052)

Circuit diagram/pin assignment



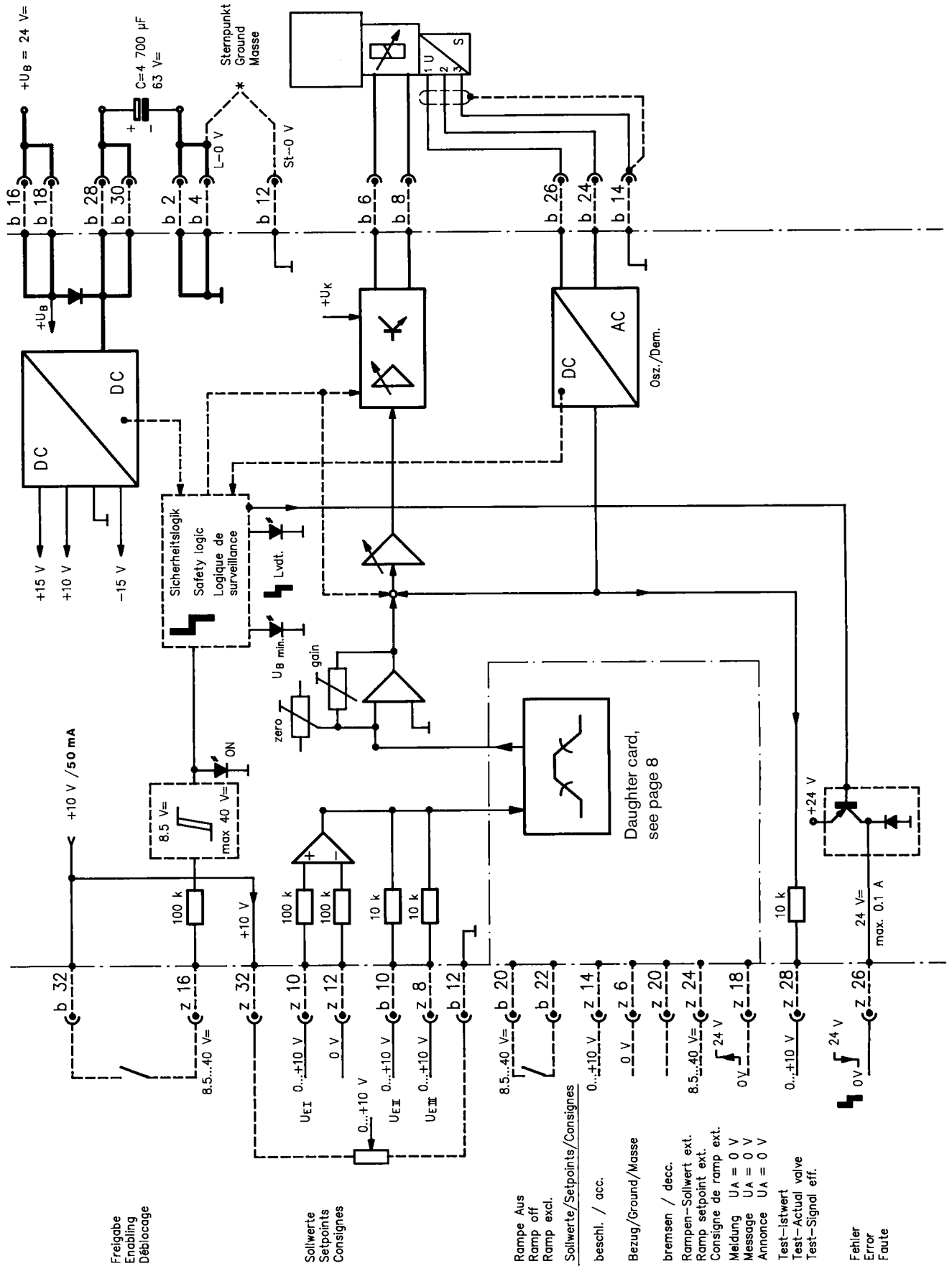
Valve with external trigger electronics (europe card with ramp, RE 30054)

Circuit diagram/pin assignment



Valve with external trigger electronics (europe card with ramp, RE 30056)

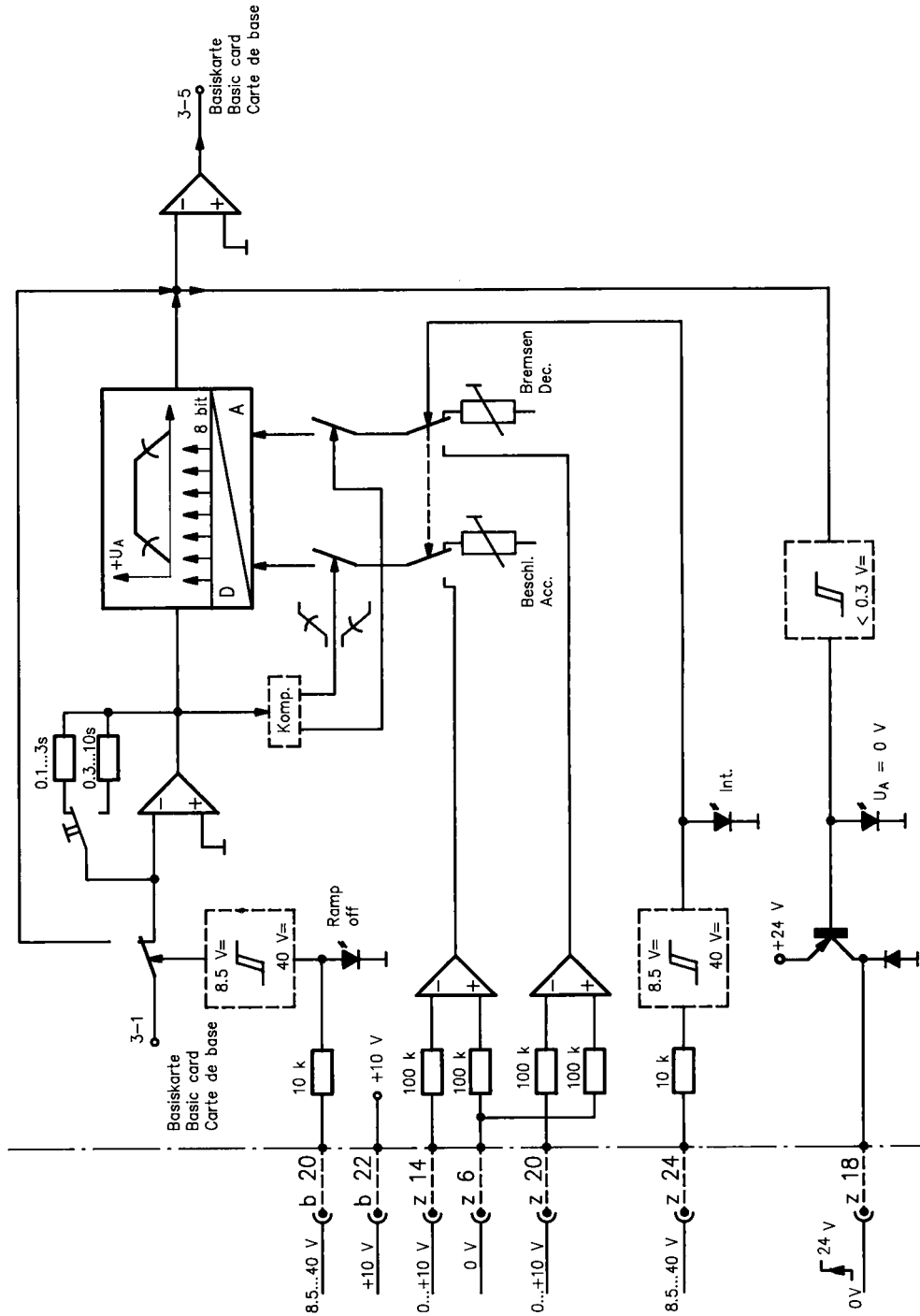
Circuit diagram/pin assignment



Valve with external trigger electronics (europe card with ramp, RE 30056)

Circuit diagram/pin assignment

Daughter card



Rampe aus
Ramp off
Ramp exclus

Sollwerte/Setpoints/Consignes
Beschl./Acc

Bezugsmasse/Ground/Masse

Bremsen/Dec.

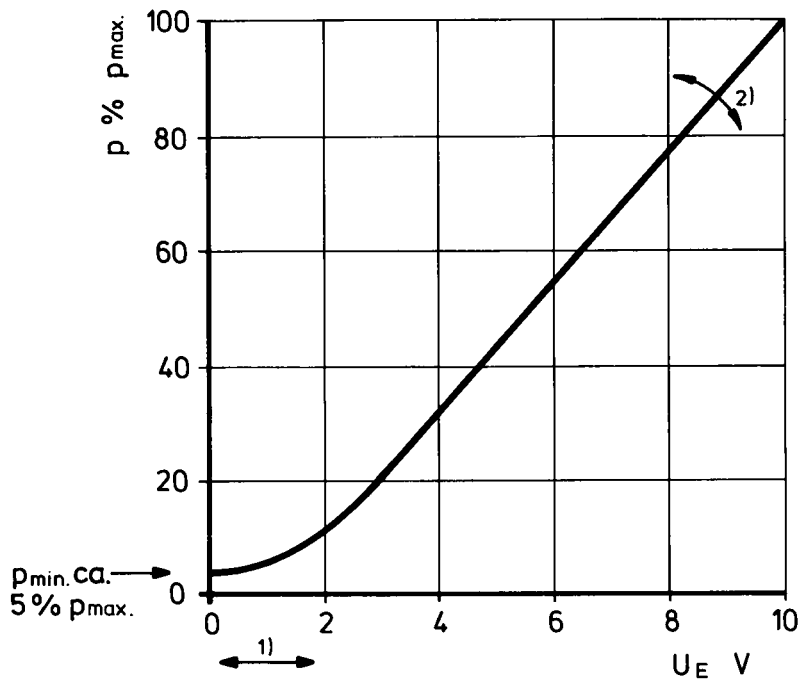
Rampensollwert Ext.
Ramp setpoint ext.
Consigne de ramp ext.

Meldung
Message
Announce

U_A = 0 V

Characteristic curves (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

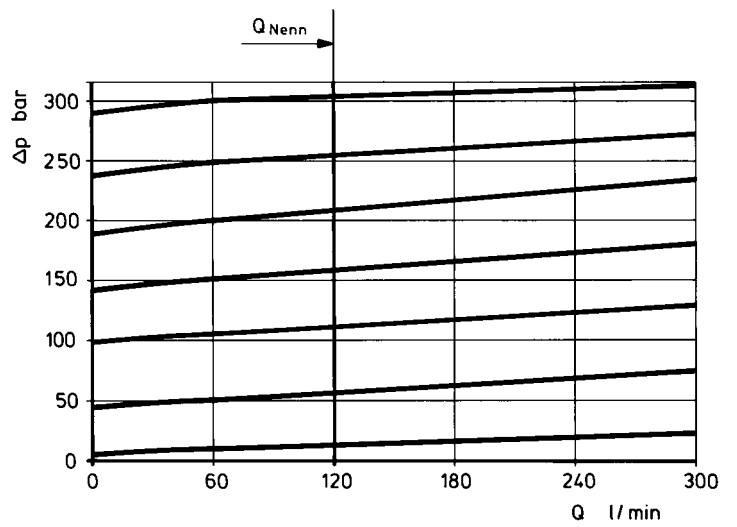
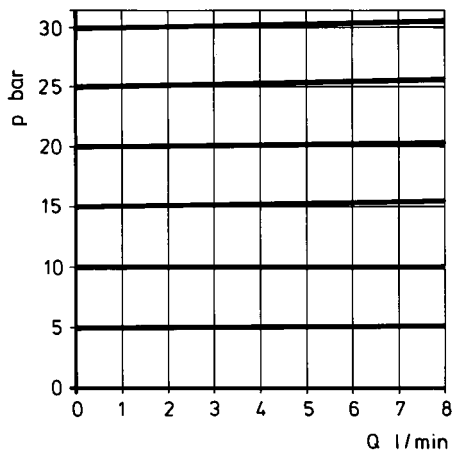
Pressure in port A as a function of the setpoint



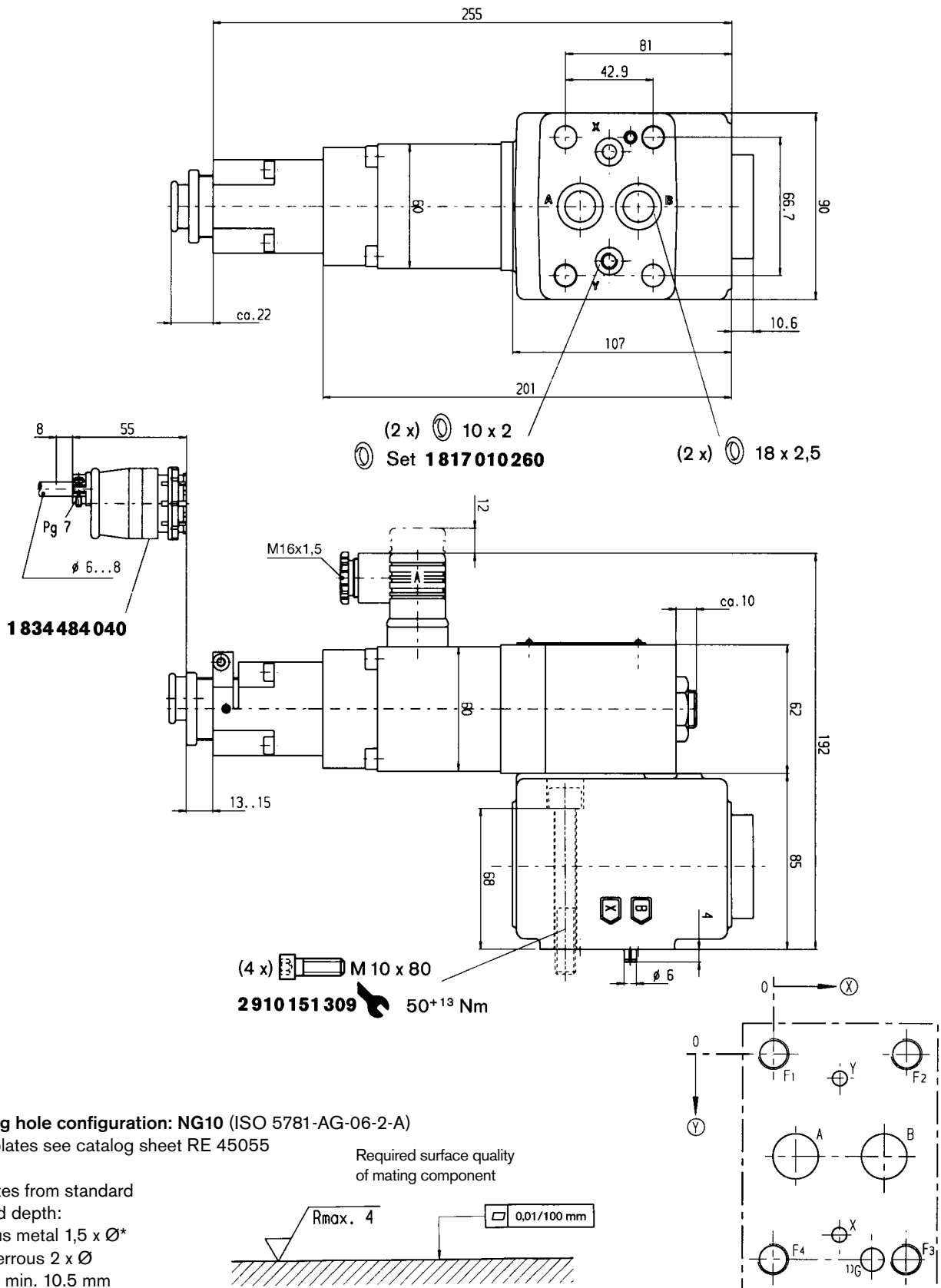
Valve amplifier
 1) Zero adjustment
 2) Sensitivity adjustment

Pressure in port A as a function of the main stage nominal flow rate

$$p = f(Q)$$



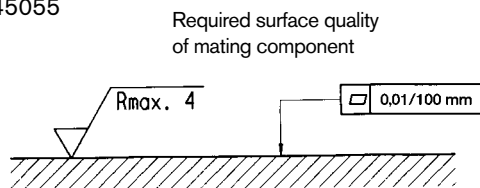
Unit dimensions (nominal dimensions in mm)



Mounting hole configuration: NG10 (ISO 5781-AG-06-2-A)

For subplates see catalog sheet RE 45055

- 1) Deviates from standard
- 2) Thread depth:
Ferrous metal 1,5 x Ø*
Non-ferrous 2 x Ø
- * NG10 min. 10.5 mm



	A	B	X	Y	G	F ₁	F ₂	F ₃	F ₄
⊗	7.2	35.8	21.4	21.4	31.8	0	42.9	42.9	0
⊙	33.35	33.35	58.7	7.9	66.7	0	0	66.7	66.7
∅	14.7	14.7	4.8	4.8	7.5	M10 ²⁾	M10 ²⁾	M10 ²⁾	M10 ²⁾

Notes

Notes
