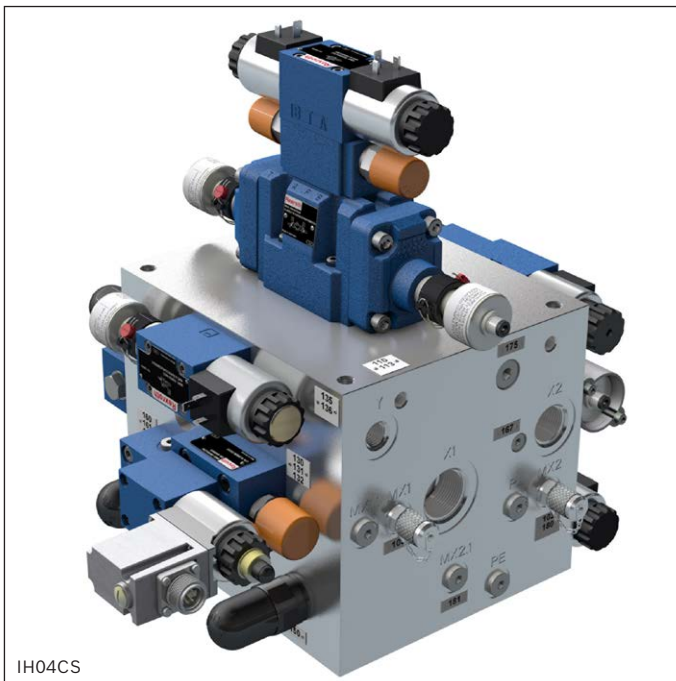


## Press module for hydraulic presses

### Type IH04C



- ▶ Size 10, 16, 25, 32, 35
- ▶ Component series 7X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 2000 l/min
- ▶ Hydraulic control with pilot-operated valves for upper piston

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#### Features

- ▶ Hydraulic control for machine types according to ISO 16092-3 and EN 289
- ▶ Test certificate HM 250065 issued by DGUV Test. The basic module 100 comprises all safety-related functions according to category 4 of DIN EN ISO 13849-1.
- ▶ The extension modules 200 include all common circuits for hydraulic presses.
- ▶ Suitable for
  - pressure/position controls
  - open circuit
- ▶ Modular design
- ▶ Supply connections lateral and at the bottom
- ▶ Thick film passivated (free from chromium(VI))

## Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14
IH04	C	-	7X	/						-	-	-	-

### Machine function

01	Upper piston	C
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### Safety category

02	According to ISO 13849, category 4, with test certificate	S
	According to ISO 13849, category 1	N

### Component series

03	Component series 70 ... 79 (unchanged installation and connection dimensions)	7X
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### Size

04	10, 16, 25, 32, 35	10 ... 35
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### Operating pressure

05	315 bar	G
	350 bar	S

### Number of mounted modules (version-dependent)

06	Basic module 100	1
	Basic module 100 with one extension module 200	2
	Basic module 100 with two extension modules 200	3

### Pump pressure limitation – Item 120

07	With manual pressure adjustment <sup>1)</sup>	B
	With proportional pressure adjustment and decompression <sup>3)</sup>	E
	With manual pressure adjustment and depressurized circulation	W

### Press force adjustment in the piston chamber – item 130

08	With manual pressure adjustment	B
	With proportional pressure adjustment and decompression <sup>3)</sup>	E
	With manual pressure adjustment and piston chamber preloading	U

### Load holding – Item 160

09	In the T channel of item 110 and with manual pressure adjustment	0
	In the T channel of item 110 and with manual pressure adjustment and switchable rapid traverse by own weight with prefill valve	1
	In the B channel of item 110 and with manual pressure adjustment <sup>2)</sup>	2
	In the B channel of item 110 and with manual pressure adjustment and switchable rapid traverse by own weight with prefill valve <sup>2)</sup>	3

### Safe reduced velocity (less than 10 mm/s) according to ISO 16092-3, Section 5.3.2.16 – Item 170

10	Without	N
	Safe reduced velocity	D
	Safe reduced velocity and testing of the restraint device	P

<sup>1)</sup> With load sensing

<sup>2)</sup> Upon request. Suitable for powder presses, synchronization control, set-up with two-hand operation, closing velocities below 10% of the maximum closing velocity, presses with small annulus areas.

Item 195 (load holding pressure relief valve):

NG10: DB10-2-4X/200W65 ⇒ Q<sub>max</sub> X2→T 200 l/min

NG16-35: DB20-2-4X/200W65 ⇒ Q<sub>max</sub> X2→T 400 l/min

From NG25, take cylinder area ratio into account; if necessary, limit rapid traverse through own weight (option 3) and press speed in accordance with Q<sub>max</sub>.

<sup>3)</sup> Standard with DBETE-7X, with DBETA-7X on request

## Ordering code

	01	02	03	04	05	06	07	08	09	10	11	12	13	14
<b>IH04</b>	<b>C</b>		<b>-</b>	<b>7X</b>	<b>/</b>						<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

### Directional valve – Item 110

11	5-4WE10E5X/EG24K4QS0G24W/M	IH04C-7X/10	<b>WE-000E</b>
	H-4WEH10E4X/6EG24SK4QM0G24		<b>WEH000E</b>
	4WRDE10V100L-5X/6L24K9/MR		<b>RDE100V</b>
	4WREEM10E75-2X/G24K34/B6V <sup>1)</sup>		<b>EEM075E</b>
	4WREE10V75-2X/G24K31/A1V <sup>1)</sup>		<b>REE075V</b>
	H-4WEH16E7X/6EG24SK4QM0G24	IH04C-7X/16	<b>WEH000E</b>
	4WRTEM16E220L-4X/6EG24K31/A1M		<b>TEM220E</b>
	4WRDE16V220L-6X/MXY/24A1		<b>RDE220V</b>
	H-4WEH25E6X/6EG24SK4QM0G24	IH04C-7X/25	<b>WEH000E</b>
	4WRTEM25E350L-4X/6EG24K31/A1M		<b>TEM350E</b>
	4WRDE25V350L-6X/MXY/24A1		<b>RDE350V</b>
	H-4WEH32E6X/6EG24SK4QM0G24	IH04C-7X/32	<b>WEH000E</b>
	4WRTEM32E600L-4X/6EG24K31/A1M		<b>TEM600E</b>
	4WRDE32V600L-5X/6L24K9/MR		<b>RDE600V</b>
	4WRTEM35E1300L-4X/6EG24K31/A1M	IH04C-7X/35	<b>TEM1K3E</b>
	4WRDE35V1000L-5X/6L24K9/MR		<b>RDE1K0V</b>
Other valves on request (e.g. 4WRPF / 4WRLF with field bus interface)			

### Extension modules – Item 200 <sup>3)</sup>

12	None	<b>NN</b>
	With rapid traverse cylinder	<b>EN</b>
	With rapid traverse cylinder and load sensing <sup>4)</sup>	<b>EL</b>
	With rapid traverse cylinder and high-response valve with zero overlap	<b>ER</b>
	With rapid traverse cylinder and pressure holding on the piston chamber side	<b>EX</b>
	With rapid traverse cylinder and accumulator operation	<b>ES</b>
	With regenerative circuit <sup>2)</sup>	<b>DN</b>
	With regenerative circuit and pressure holding on the piston chamber side <sup>2)</sup>	<b>DX</b>
	With high-pressure and low-pressure pumps <sup>2)</sup>	<b>HN</b>
	With high-pressure and low-pressure pumps and pressure holding on the piston chamber side <sup>2)</sup>	<b>HX</b>
	With load sensing <sup>4)</sup>	<b>LN</b>
	With load sensing and pressure holding on the piston chamber side <sup>4)</sup>	<b>LX</b>
	With high-response valve with zero overlap	<b>RN</b>
	With high-response valve with zero overlap and pressure holding on the piston chamber side	<b>RX</b>
	With pressure holding on the piston chamber side	<b>XN</b>
	With pressure holding on the piston chamber side and accumulator operation	<b>XS</b>
	With accumulator operation	<b>SN</b>
With slide cushion	<b>ZN</b>	

### Voltage

13	DC voltage 24V	<b>G24</b>
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### Additional version (optional)

14	Without	
	Directional valve item 110 with asymmetric spool P→A: q <sub>v</sub> ; P→B: q <sub>v</sub> /2	<b>001</b>
	Set-up by own weight (greater than 10 mm/s, PLe/Cat. 4)	<b>002</b>

<sup>1)</sup> Up to 315 bar only, otherwise on request

<sup>2)</sup> Up to NG 25 only

<sup>3)</sup> Additional combinations available on request

<sup>4)</sup> Only in combination with proportional directional control valve on item 110

## Function

The press module type C is a hydraulic control for installation in hydraulic presses according to EN ISO 16092-3 or plastic and rubber machines according to EN 289 and, according to DIN EN ISO 13849-1, is regarded as a "safety-related part of control systems". For plastic and rubber machines according to EN 289 with a platen depth greater than 800 mm and a stroke greater than 500 mm, a mechanical restraint device is required in accordance with the specifications of this standard. The industrial area of application is extended to all machine

types which require the safety requirements of the above-specified standards.

The press module type C allows the user to design, construct, and/or modify their upper piston functions such as press ram, blank pressure pad, and slide cushion according to the general safety requirements. In connection with a suitable electrical control, the following performance levels and categories can be achieved:

Safety measures for the hazard type	Extract from standard	Performance level (PL)	Safety category
Avoiding the unintended lowering under own weight	ISO 16092-3 section 5.3.7.2	e	4
Avoiding the unintended start-up from the rest position	ISO 16092-1 section 5.4.1.1.4a)	e	4
Stopping of the dangerous closing movement	ISO 16092-1 section 5.4.1.1.4c)	e	4
Set-up by own weight (greater than 10 mm/s, PLe/Cat. 4)	ISO 16092-3 section 5.3.7.2 ISO 16092-1 Section 5.4.1.1.4a), 4c)	e	4
Safe reduced velocity less than 10 mm/s with hold-to-run device	ISO 16092-3 section 5.3.2	d	3

The aforementioned safety functions were tested by the accredited testing authority DGUV-Test and certified with test certificate HM 250065.

Additionally to ISO 16092-3, section 5.3.7.3, unintended lowering under own weight during retraction is safely prevented by the hydraulic restraint device item 140. During muting, errors can be recognized in time by analysis of the end-switch signal S14.

The function "Set-up by own weight (greater than

10 mm/s, PLe/Cat. 4)" is not a safe movement.

This function may only be used with active/closed safety devices and not for set-up with a safe reduced velocity of less than 10 mm/s.

### Basic module 100

A complete press module type C consists at least of the basic module item 100 and the directional valve item 110. The safety-related functions (Cat. 1 or 4) are part of the basic design and do not influence the set-up of the additional extension modules item 200 <sup>1)</sup>.

The pump and tank connections are arranged laterally and at the bottom and allow for optimal installation into the press on <sup>2)</sup>. All other actuator ports are arranged laterally<sup>2)</sup>. All measuring points are provided with two connections.

<b>Safety-related hydraulic control according to category 4 of ISO 13849</b>	Directional valve with position monitoring (channel 1)	Item 110
	Pump pressure limitation	Items 120 ... 122
	Protection against unwanted pressure build-up on the piston chamber side (channel 2) <sup>3)</sup>	Items 130/131/135
	Restraint device on the annulus area side (channel 2)	Items 140/145
	Pressure limitation on the annulus area side against pressure intensification	Items 150/151
	Safe reduced velocity less than 10 mm/s according to ISO 16092-3, section 5.3.2	Items 170 ... 175
<b>Basic functions</b>	Press force adjustment	Items 130 ... 132
	Load holding	Items 160 ... 165
<b>Additional function</b>	Rapid traverse due to own weight via prefill valve	Item 166

<sup>1)</sup> With exception, high-response valves with zero overlap → Prerequisite RN and slide cushion ZN

<sup>2)</sup> From NG35, only the tank port T1.1 arranged at the bottom is available

<sup>3)</sup> In the basic design, the cylinder piston side is unloaded to the tank when switching to the safe state. If this unloading is undesirable, please use an extension module with the function "Pressure holding on the piston chamber side" or a suitable additional version.

## Function

### Extension modules 200

With the extension modules item 200, further common variants are available for selection. The extension modules item 200 are installed between the basic module item 100 and the directional valve item 110 and their port pattern corresponds to the port pattern of the directional

valve item 110. When the extension modules item 200 are used, the safety of the hydraulic control is maintained. All actuator ports are arranged laterally. All measuring points are provided with two connections.

Variants		
	Rapid traverse due to rapid traverse cylinder	Item 210
	Operation with high-pressure and low-pressure pumps	Item 220
	Rapid traverse with regenerative circuit	Item 230
	Accumulator operation	Item 240
	Slide cushion	Item 250
	Set-up by own weight (greater than 10 mm/s, PLe/Cat. 4)	Item 260
	Load-sensing	Item 270
	Pressure holding on the piston chamber side	Item 280
	High-response valve with zero overlap without detection of direction <ul style="list-style-type: none"> <li>- Energy separation on the piston chamber side (channel 1)</li> <li>- Blocking of the annulus side (channel 1)</li> </ul>	Item 290

### Installation

The piping must permanently withstand the maximum operating pressure and comply with the safety requirements according to ISO 16092-1, Section 5.2.1 and Section 5.2.3 as well as ISO 16092-3, Section 5.2.3. Additionally it must be ensured that the pipeline between

the press module type "C" (port X2) and the annulus area is designed for the max. set pressure of the pressure relief valves (items 150/151). The pipeline design must be as short as possible.

#### Notice:

Detailed information on the system design and installation as well as commissioning can be found in the assembly instructions for press modules, type IH04C (instructions 63142-MON).

## Technical data

(For device application outside the specified values, please contact us!)

General	
Installation position	Vertical with directional valve item 110 on top
Safety-relevant on/off valves	Without manual override
Coating	Galvanic coating DIN EN ISO 19598 – Fe/Zn8//Cn/T0
Labelling	▶ Technical items ▶ Outputs
	Aluminum, riveted Engraved
Ambient temperature range	°C -20 ... +50
Storage temperature range	°C +10 ... +40
Storage time more than 6 months	Specify in plain text when ordering

Hydraulic		Cast iron version	Steel version
Maximum operating pressure	▶ Ports <sup>1)</sup> P1.1 ... P1.7, X1, X11, X12, PL, PE, HD, S, LS1, MX12.1	315	350
	▶ Connection <sup>1)</sup> X2	350	400
Maximum return flow pressure	▶ Port <sup>1)</sup> T1.1, T1.2	16	
	▶ Connection Y	Separately at zero pressure to the tank	
Recommended pilot pressure		30 ... 200	
Recommended load pressure		20 ... 115 <sup>6)</sup> (different load pressures on request)	
Measuring ports		Including measuring couplings	
Operating medium <sup>2)</sup>		Mineral oil (HL, HLP) according to DIN 51524-1, other hydraulic fluids upon request	
Temperature range of the hydraulic fluid	°C	-20 ... +80, preferably +40 ... +50	
Viscosity range of the hydraulic fluid	mm <sup>2</sup> /s	10 ... 500, preferably 30 ... 46	
Maximum admissible degree of contamination of the hydraulic fluid		Cleanliness class 18/16/13 according to ISO 4406 (c) <sup>3)</sup> Cleanliness class 17/15/12 according to ISO 4406 (c) for the pilot valve <sup>4)</sup> of 4WRDE	
Seal material		NBR, others upon request	

Sizes		10	16	25	32	35	
Nominal flow <sup>5)</sup>	▶ P1	l/min	140 <sup>8)</sup>	300 <sup>8)</sup>	600	1000	2000 <sup>9)</sup>
	▶ HD	l/min	70	130	260	–	–
	▶ X1→T	l/min	250	500	700	1200	2100
	▶ X2→T1 <sup>6)</sup>	l/min	140	300	600	1000	2000
Recommended pump size (1500 rpm) <sup>7)</sup>		cm <sup>3</sup>	100	210	355	2 x 355	4 x 355

<sup>1)</sup> Order connection flanges separately, see page 40.

<sup>2)</sup> The ignition temperature of the operating medium used must be higher than the maximum coil temperature of the valves. See data sheets of the components used.

<sup>3)</sup> Effective filtration is to be provided separately. This prevents faults and simultaneously extends the life cycle of the components. See data sheets of the components used.

<sup>4)</sup> Flushing element to be ordered separately, HSA06A012-4X/V00 (R901092348) or 4WE6J6X/EG24N9K4 (R900561288).

<sup>5)</sup> The maximum flow and the maximum hydraulic power of the press module are determined by the directional valve item 110.

<sup>6)</sup> Design the rapid traverse due to own weight with prefill valve with at least 25 bar load holding pressure. Below 25 bar upon request.

<sup>7)</sup> For recommended pump versions, see pages 42 and 43.

<sup>8)</sup> Extension module "SN": For sizes 10 and 16, verification is required according to the applicable valve data sheets that the safety valve .246 is sufficient for the maximum pump volume.

The maximum flow rate of the safety valves is only valid for a counter pressure of 0 bar in the discharge line. At higher counter pressures, the maximum flow is reduced according to the specifications in the applicable valve data sheets.

<sup>9)</sup> Up to 3000 l/min with 2 directional valves item 110 on request

NG IH04	Nominal flow	Item 246	Data sheet
10	140 l/min	R900769372 (DBDH10K1X/330)	25402
16	300 l/min	R901265679 (DB20K1-1X/330YE)	25818

### Notice:

In the as-delivered state, the mechanical adjusters of the pressure relief valves (items 121, 131, 150/151, 165) and the stroke limitations (items 140 and 161) are completely screwed-out. In the as-delivered state, the type-examination tested safety valve item 246 (only available with accumulator operation) is set and sealed according to the Pressure Equipment Directive 2014/68/EU.

## Technical data

(For applications outside these values, please consult us!)

Electrical		
Voltage type		Direct voltage
Duty cycle	%	100
Protection class according to DIN EN 60529		IP65 with mating connector mounted and locked <sup>1)</sup>
Maximum surface temperature of the coil <sup>2)</sup>	°C	150
Voltage	V	24 +/- 10%



### Notice:

With the electrical connection "K4", the protective grounding conductor (PE) must be connected properly.

High-response valves <sup>3)</sup>		
Voltage	V	24 +/- 10%
Command value input	V	+/- 10%
Control electronics		On Board Electronic (OBE)

- 1) Mating connectors are not included in the scope of delivery and must be ordered separately. See data sheet 08006.
- 2) Due to the temperatures occurring at the surfaces of the solenoid coils, the standards ISO 13732-1 and EN ISO 4413 must be observed.
- 3) See the data sheet of the component being used for the functionality, technical data, integrated control electronics, performance limits, characteristic curves, and general information.



### Notice:

For the environment simulation testing for EMC (electro-magnetic compatibility), climate and mechanical load, see data sheet of the component used.

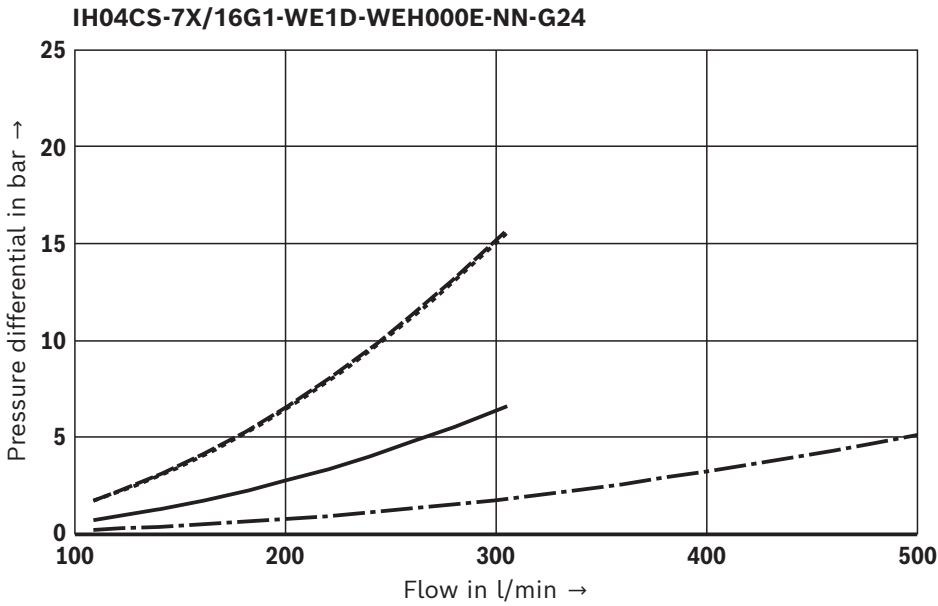
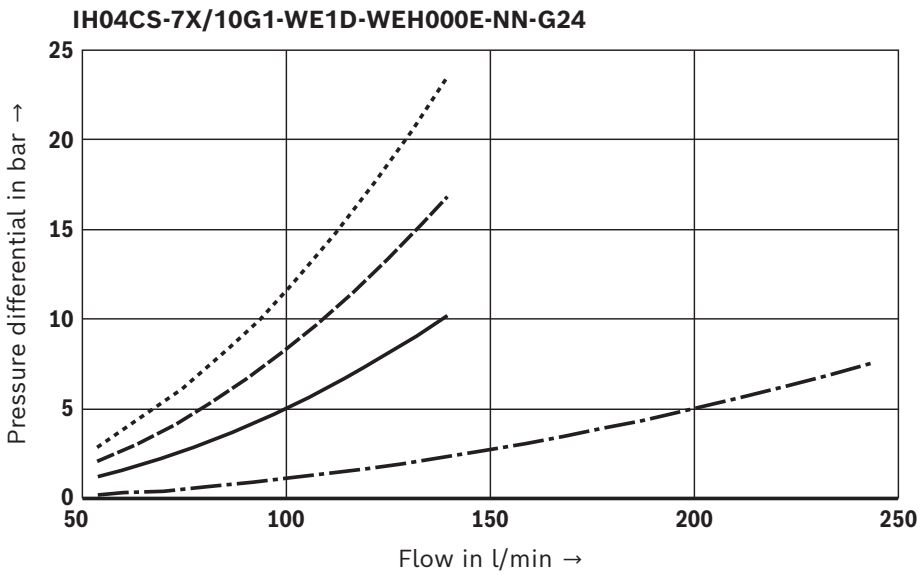
## Safety-relevant components

For information on the electrical characteristics of the inductive position switches such as connection voltage,

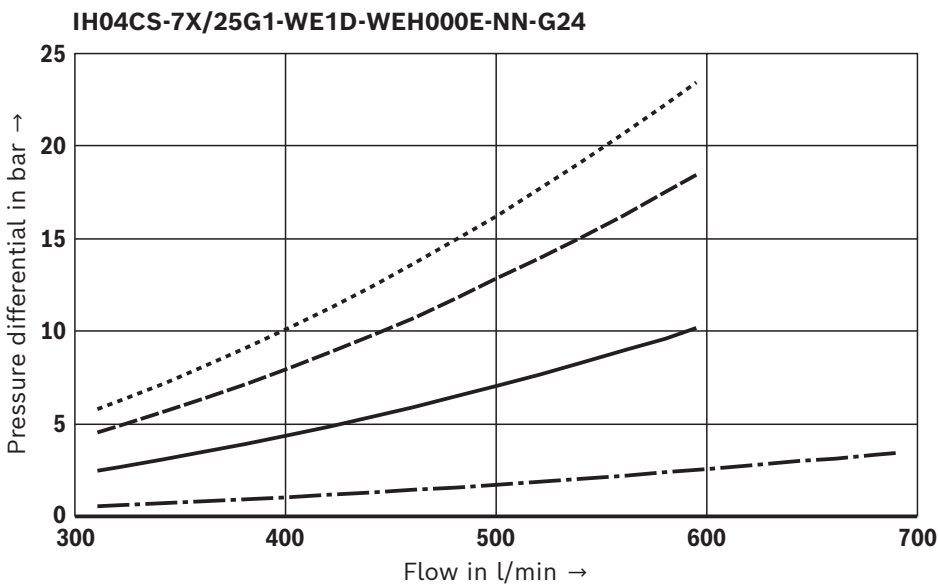
load capacity, admissible residual ripple, switching outputs, and pinout please refer to the data sheets listed in the following table:

Technical item	Type designation	IH04C-7X	Limit switch designation	Data sheet
Item 110	5-4WE10...QS0	NG10	S11a, S11b, S12, S23	24830
	H-4WEH...QMO	NG10-32		
	4WREEM	NG10		
	4WRTEM	NG10-35	S11	29083
Items 135, 260, 292, 297	4WE6...QMB	NG10-32	S13, S26, S29.2, S29.7	24830
	5-4WE10...QMB	NG35		
Item 140	LFA...E...QM	NG10-35	S14	21015
Item 250	H-3WEH...QMB	NG10-35	S25	24830
Items 290, 295	LC2A...B...Q7	NG10-35	S29.0, S29.5	21040
Item 170	4WE	NG10-35		23178
Item 174	M-3SED...QMB	NG10-35	S17	24830

### Characteristic curves

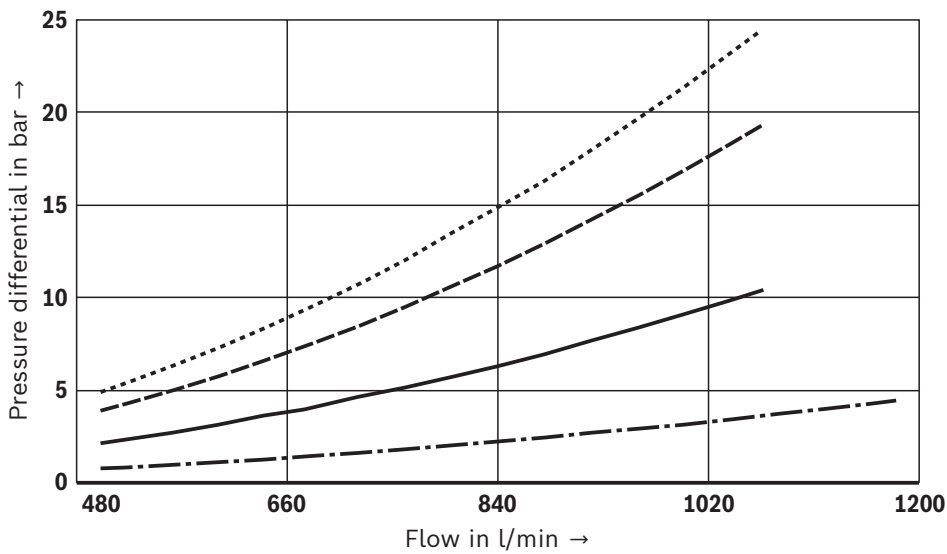


- P1.1 → X1
- - - P1.1 → X2
- · - X1 → T1.1
- X2 → T1.1

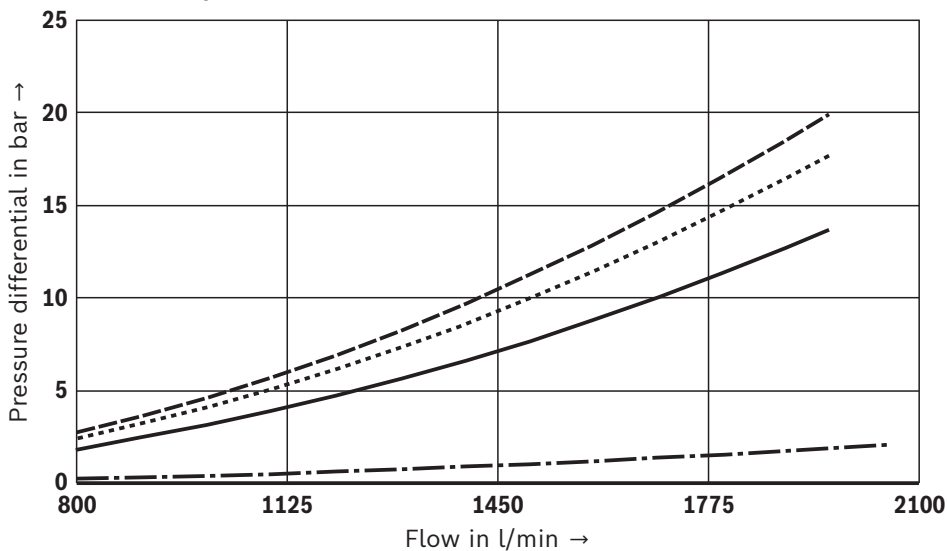


## Characteristic curves

IH04CS-7X/32G1-WEH000E-NN-G24



IH04CS-7X/35G1-WE1D-TEM1K3E-NN-G24



— P1.1 → X1  
 - - - P1.1 → X2  
 - · - · X1 → T1.1  
 ····· X2 → T1.1

### Notice:

- ▶ The characteristic curves were measured with directional on/off valve WEH000E on item 110. When using a proportional/high-response valve, other pressure differentials result according to the valve characteristics and valve opening.
- ▶ In configurations with load sensing, it may be necessary to adjust the flow controller of the pump (increasing the standard setting by 14 bar) to achieve the required flow rate.
- ▶ Characteristic curves without extension modules item 200

**Basic functions according to safety category 4 (ISO 13849-PLe):****IH04CS-7X/...1-WE0N-WEH000E-NN-G24**

The following description is based on a cyclic control and position monitoring of the valves.

- ▶ Failure of any of the position-monitored valves must be detected by an external safety PLC and the start of the next dangerous movement after an error has to be prevented. Direction error immediate stop.
- ▶ The load holding pressure is the total of slide weight and weight of the top tool part acting on the effective annulus area.
- ▶ During muting (e.g. during retraction), the solenoids Y13 (S13) and Y14 (S14) must be switched-off.

**Option W – Item 120**

The pressure relief valve item 120/121 limits the pressure of the motor pump station. At the pressure relief valve item 121, the maximum operating pressure is set.

The on/off valve item 122 provides pilot control for the pressure relief valve item 120/121. The pressure relief valve item 120/121 is switched to depressurized circulation in the basic position. Energization of the solenoid Y12 causes the pressure set at the pressure relief valve item 120 to become effective.

**Option WEH000E – Item 110**

The movement direction of the cylinder piston is determined by the directional valve item 110:

- ▶ The cylinder piston is extended with the control signal Y11b.
- ▶ The cylinder piston is retracted with the control signal Y11a.

By means of the position monitoring S11a and S11b, it is monitored whether

- ▶ the closed central position is reached in every pressing cycle.
- ▶ the movement direction is correct.

**Option E – Item 130**

The pressure relief valve item 130/131 serves for pressure limitation on the piston chamber side of the cylinder.

At the pressure relief valve item 131, the maximum press pressure is set. The proportional pressure relief valve item 132 provides pilot control of the pressure relief valve item 130/131 and determines the press pressure by means of the control signal Y13.1 (e.g. press force, decompression, preload during retraction):

- ▶ When the set pressure is exceeded, the pressure relief valve item 130 will open to the tank.
- ▶ When the set pressure is no longer reached, the pressure relief valve item 130 will close.

**Functional safety item 135**

Protection against unwanted pressure build-up on the piston chamber side is realized by the directional valve item 135. In its basic position, the pressure relief valve item 130/131 is switched to depressurized circulation.

By means of the electrical position monitoring S13 it can be monitored whether the basic position is reached in

every pressing cycle. Energization of the solenoid Y13 causes the pressure set at the pressure relief valve item 132 to become effective.

**Functional safety item 140**

The 2-way cartridge valve in item 140 holds the cylinder piston in position (EN ISO 16092-3 section 5.3.7.2). During load holding/retraction, the valve item 140 acts as a check valve and during extension as a switchable isolator valve. By means of the position monitoring S14 it is monitored whether the basic position is reached in every pressing cycle. The seat valve item 145 unlocks the 2-way cartridge valve item 140 during extension.

**Functional safety item 150**

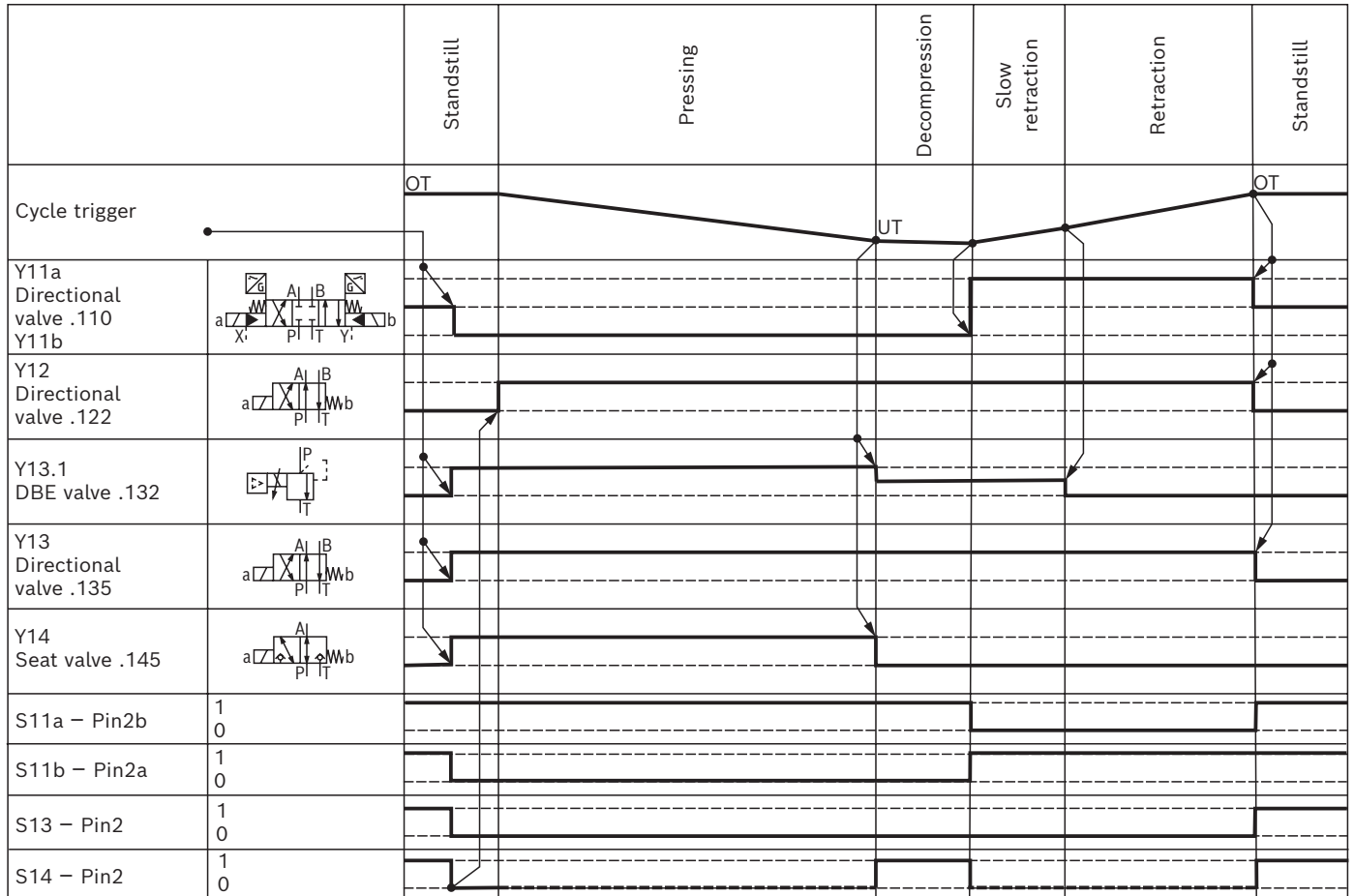
The pressure relief valves items 150/151 serve as protection against pressure intensification in the annulus area of the cylinder. According to DIN ISO 16092-3 section 5.2.3.3, they must be set to at least 10% above the maximum operating pressure item 120 and sealed. The minimum area ratio of the cylinder in reference to the maximum pump flow and the maximum flow of item 150/151 must be observed.

**Option 0 – Item 160**

During the pressing process, the pressure relief valve consisting of items 160/161/165 compensates the load holding pressure on the annulus area side. The pressure relief valve item 165 is to be set so that the cylinder piston does not drop during standstill:

- ▶ When the set pressure is exceeded, the pressure relief valve item 160 will open to the tank.
- ▶ When the set pressure is no longer reached, the pressure relief valve item 160 will close.

**Basic functions according to safety category 4 (ISO 13849-PLe):**  
 IH04CS-7X/...1-WE0N-WEH000E-NN-G24





## Rapid traverse due to own weight via prefill valve: IH04CS-7X/...1-WE1N-WEH000E-NN-G24

### Option 1 – Item 160

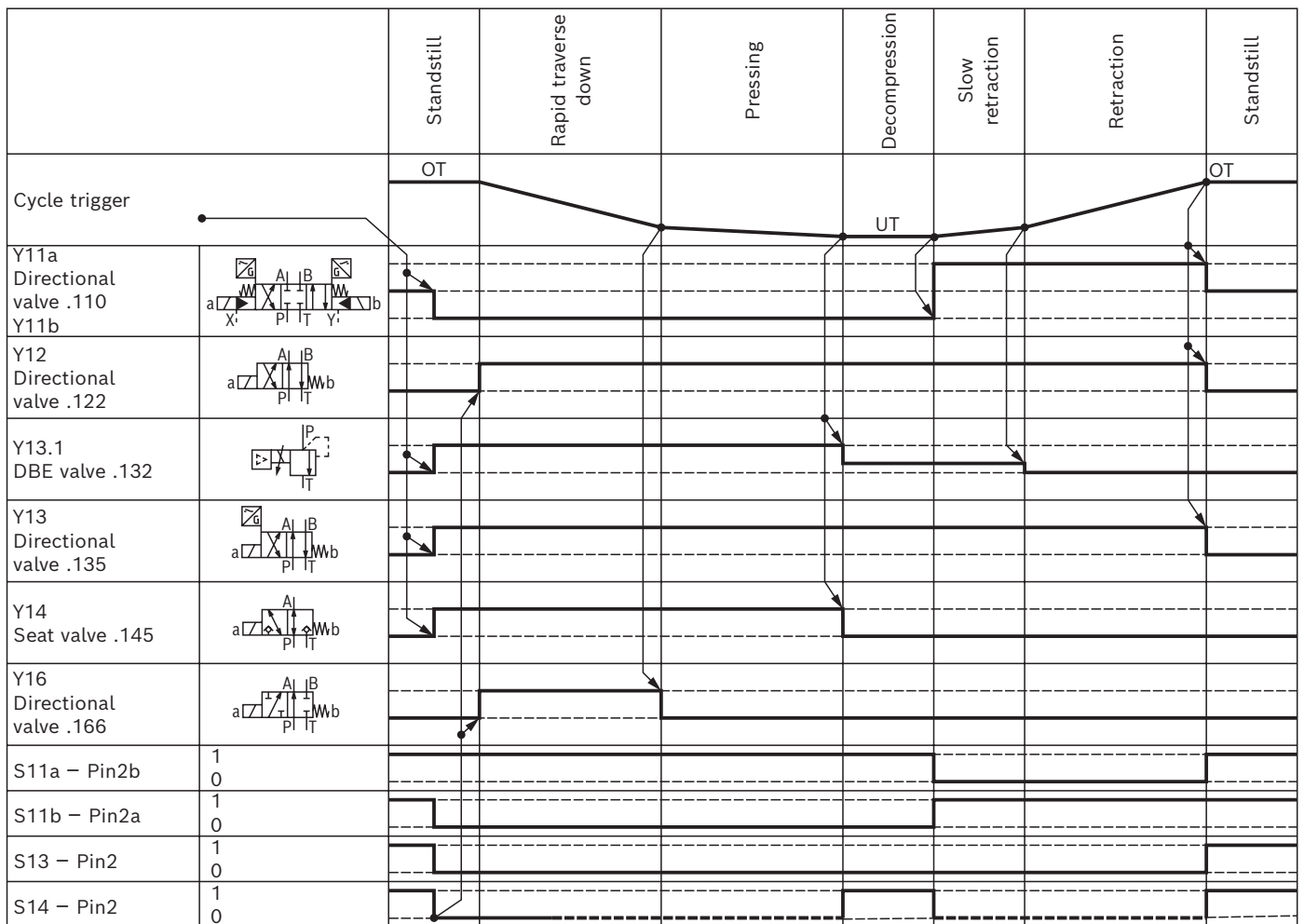
During the pressing process, the pressure relief valve consisting of items 160/161/165 compensates the load holding pressure on the annulus area side. The pressure relief valve item 165 is to be set so that the cylinder piston does not drop during standstill:

- ▶ When the set pressure is exceeded, the pressure relief valve item 160/161 will open to the tank.
- ▶ When the set pressure is no longer reached, the pressure relief valve item 160/161 will close.

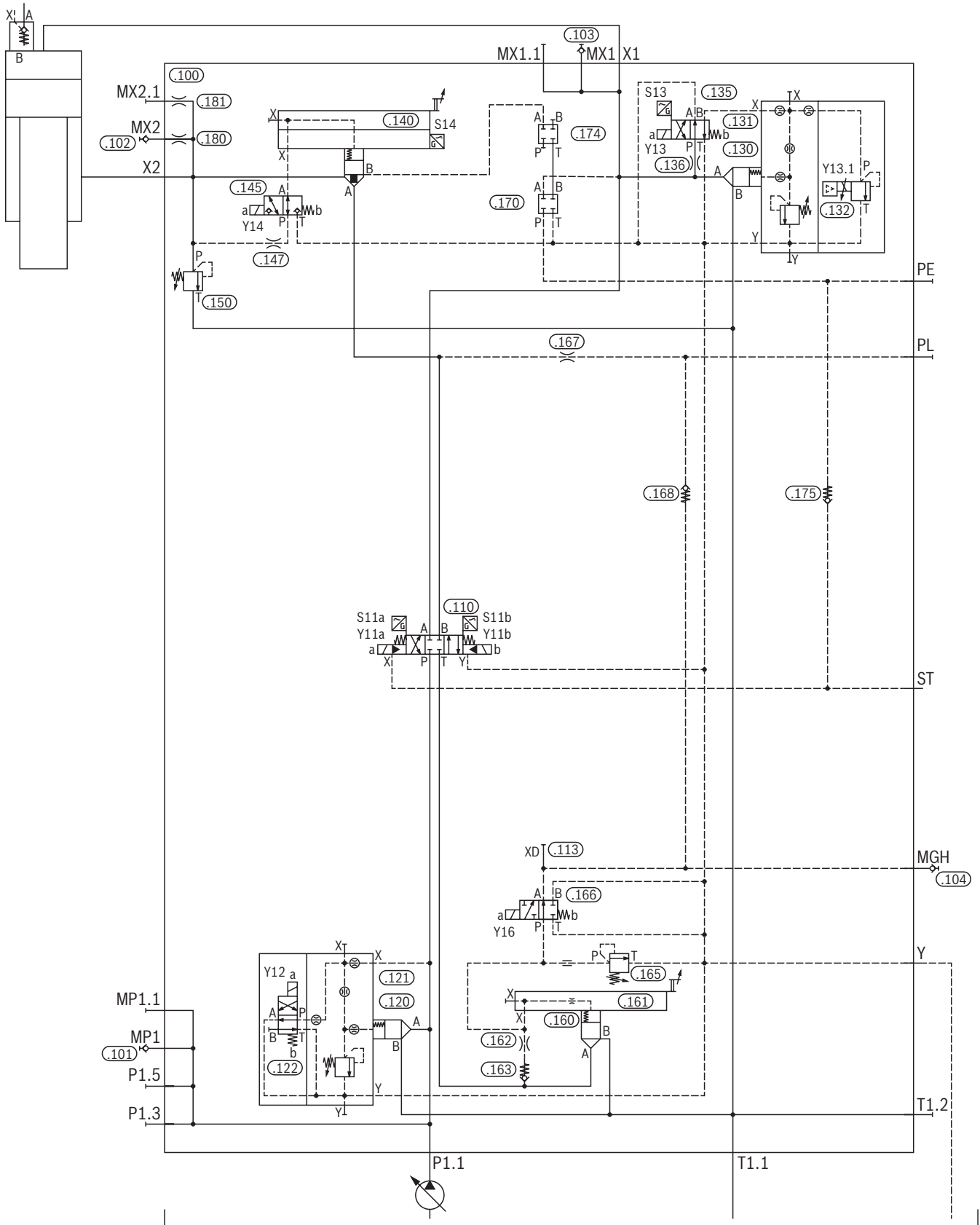
The valve item 166 provides pilot control for the rapid traverse phase and the load-holding pressure compensation:

- ▶ In basic position (Y16 – OFF) the load holding pressure compensation takes effect
- ▶ With energization of the solenoid (Y16 – ON), the rapid traverse phase without load holding pressure compensation takes effect.

Using the stroke limitation at the logic cover item 161, the maximum rapid traverse velocity is set.



**Rapid traverse due to own weight via prefill valve: IH04CS-7X/...1-WE1N-WEH000E-NN-G24**

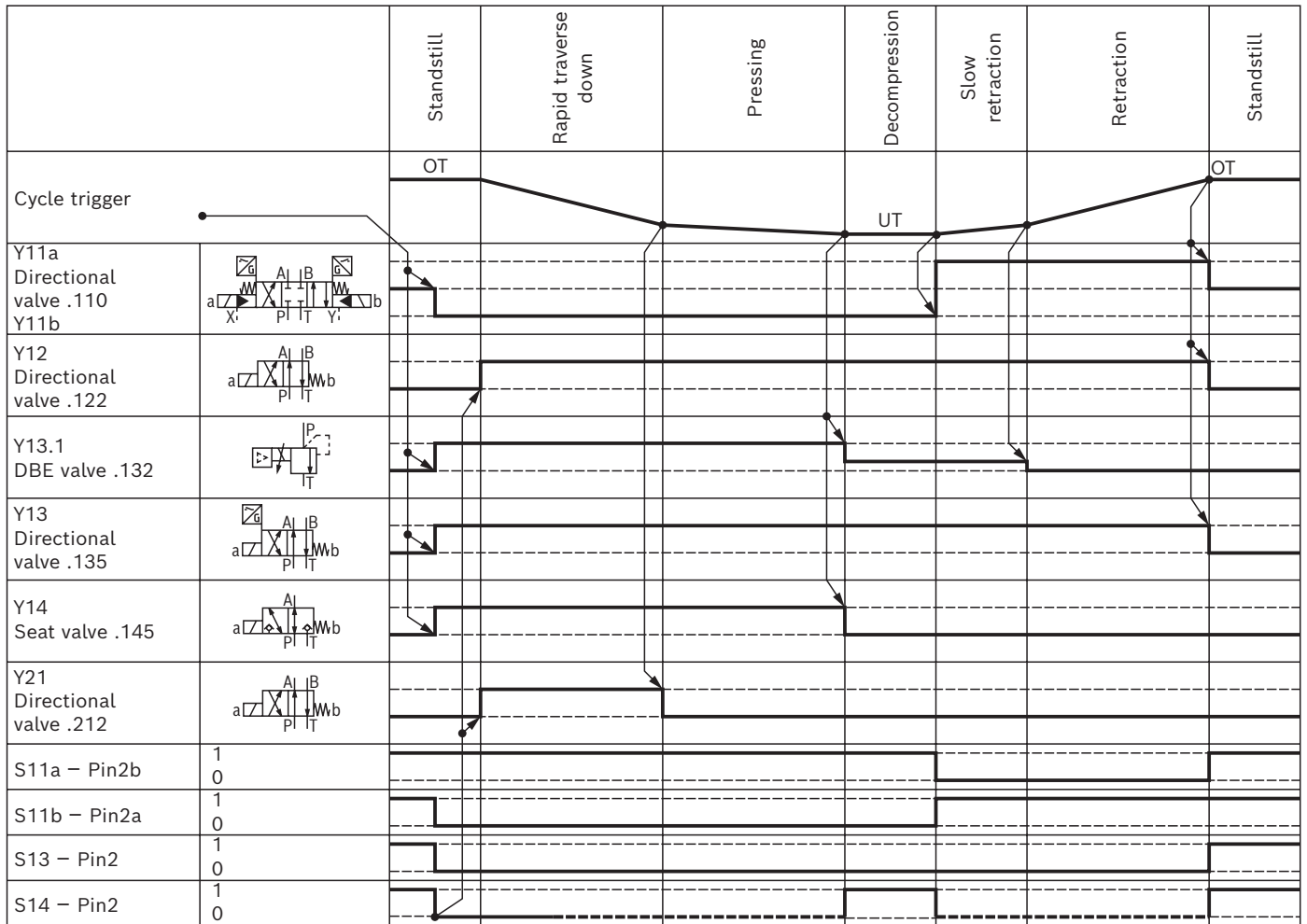


### Rapid traverse due to rapid traverse cylinder: IH04CS-7X/...2-WE0N-WEH000E-EN-G24

#### Option 1 – Item 210

The 2-way cartridge valve consisting of item 210/211 separates the rapid traverse piston chamber from the pressing piston chamber. With energization of the solenoid (Y21 – ON), the cartridge valve item 210/211 closes. The rapid traverse phase takes effect. At the end of rapid traverse, valve item 212 is de-energized, the 2-way cartridge valve item 210/211 opens.

The hydraulic is applied to both piston areas. The end of the pressing process is followed by joint decompression. During retraction, the oil volume flows from the rapid traverse piston chamber via the 2-way cartridge valve item 210/211 to the pressing piston chamber and via the prefill valve to the tank.





### Rapid traverse due to regenerative circuit: H04CS-7X/...2-WE0N-WEH000E-DN-G24

#### Option 0 – Item 165

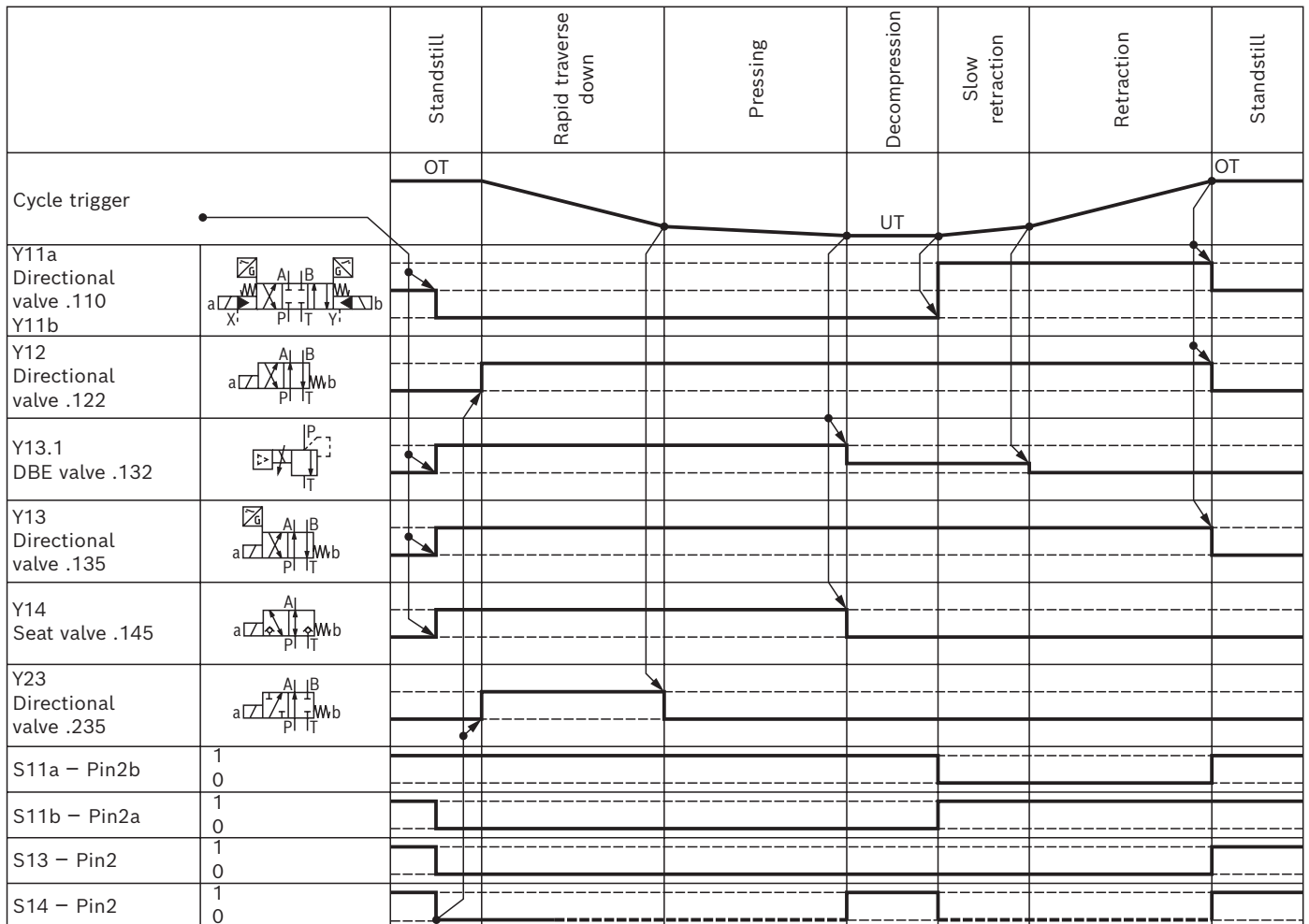
The pressure relief valve item 165 limits the pressure of the tank line item 110 and is to be set to the maximum pressure rating.

#### Option DN – Item 230

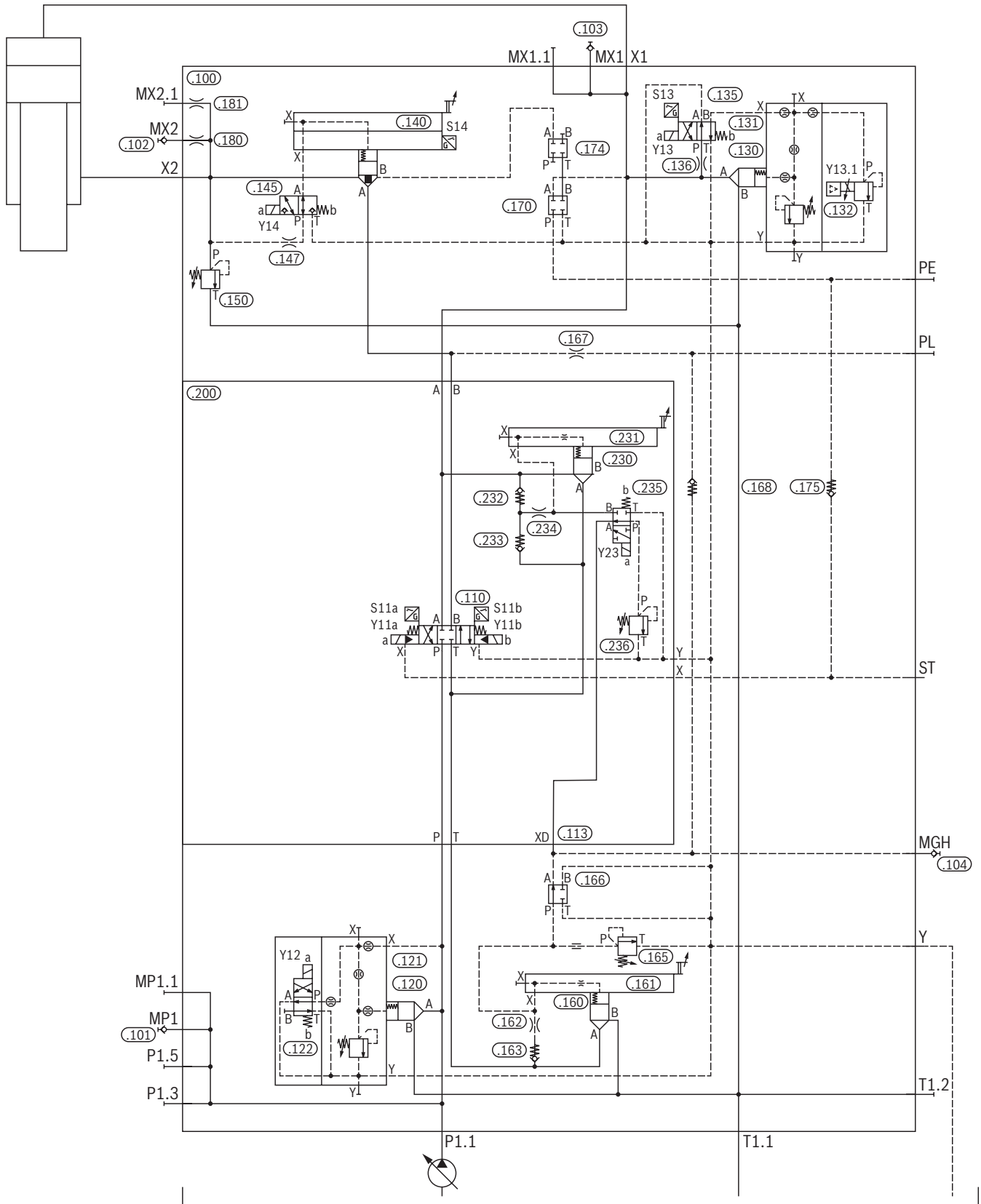
During the rapid traverse phase, the 2-way cartridge valve consisting of the items 230/231 compensates the load holding pressure. The pressure relief valve item 236 is to be set so that the cylinder piston does not drop during standstill.

The valve item 235 provides pilot control for the rapid traverse and the pressing process:

- ▶ With energization of the solenoid (Y23 – ON), the load holding pressure compensation takes effect during the rapid traverse via the pressure relief valve item 230/231/236 from the annulus area to the piston chamber.
- ▶ In basic position (Y23 – OFF), the load holding pressure compensation takes effect during the pressing process via the pressure relief valve item 160/161/236 from the annulus area to the tank.



**Rapid traverse due to regenerative circuit: H04CS-7X/...2-WE0N-WEH000E-DN-G24**



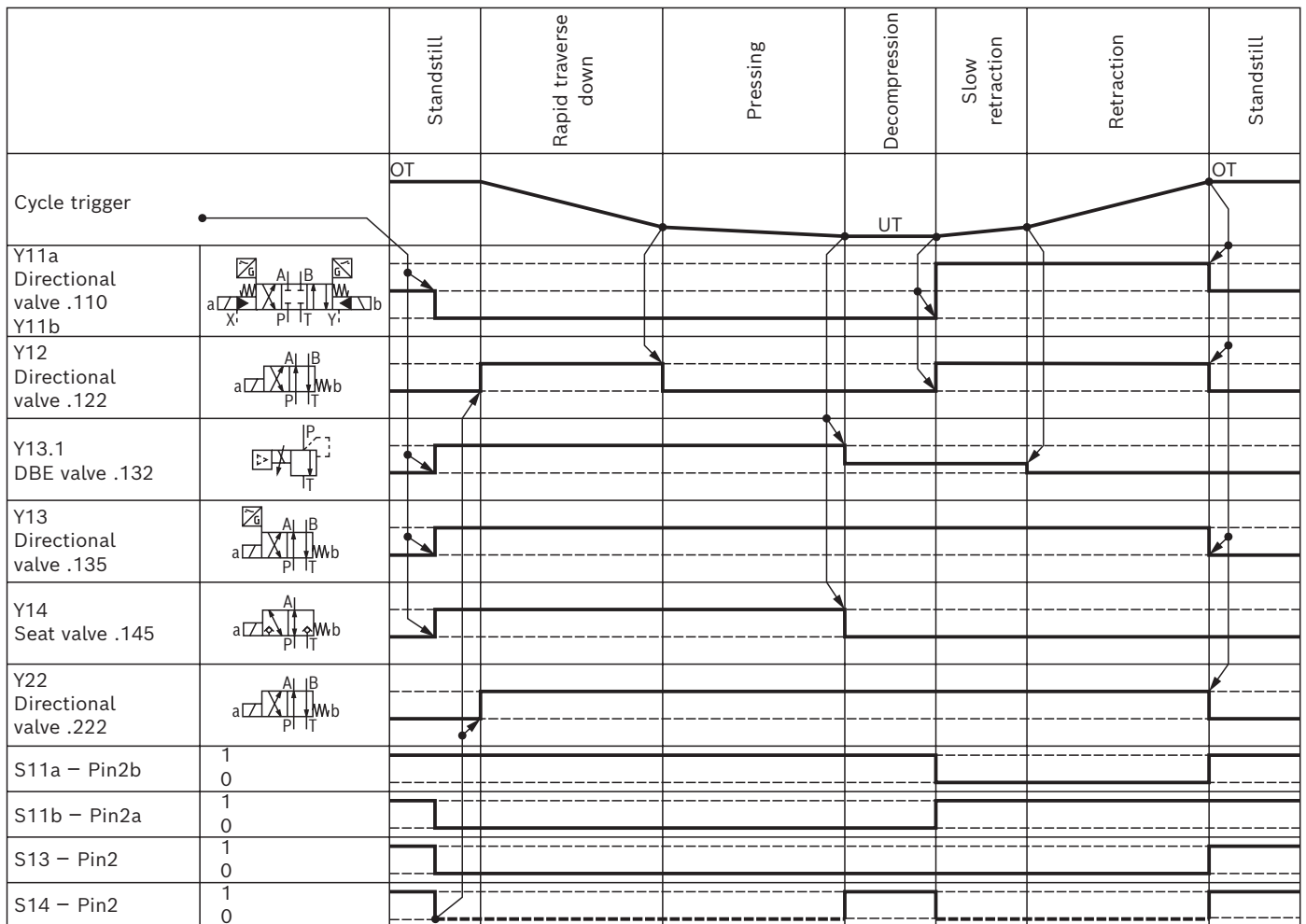
### Operation with high- and low-pressure pumps: IH04CS-7X/...2-WE0N-WEH000E-HN-G24

#### Option W – Item 120

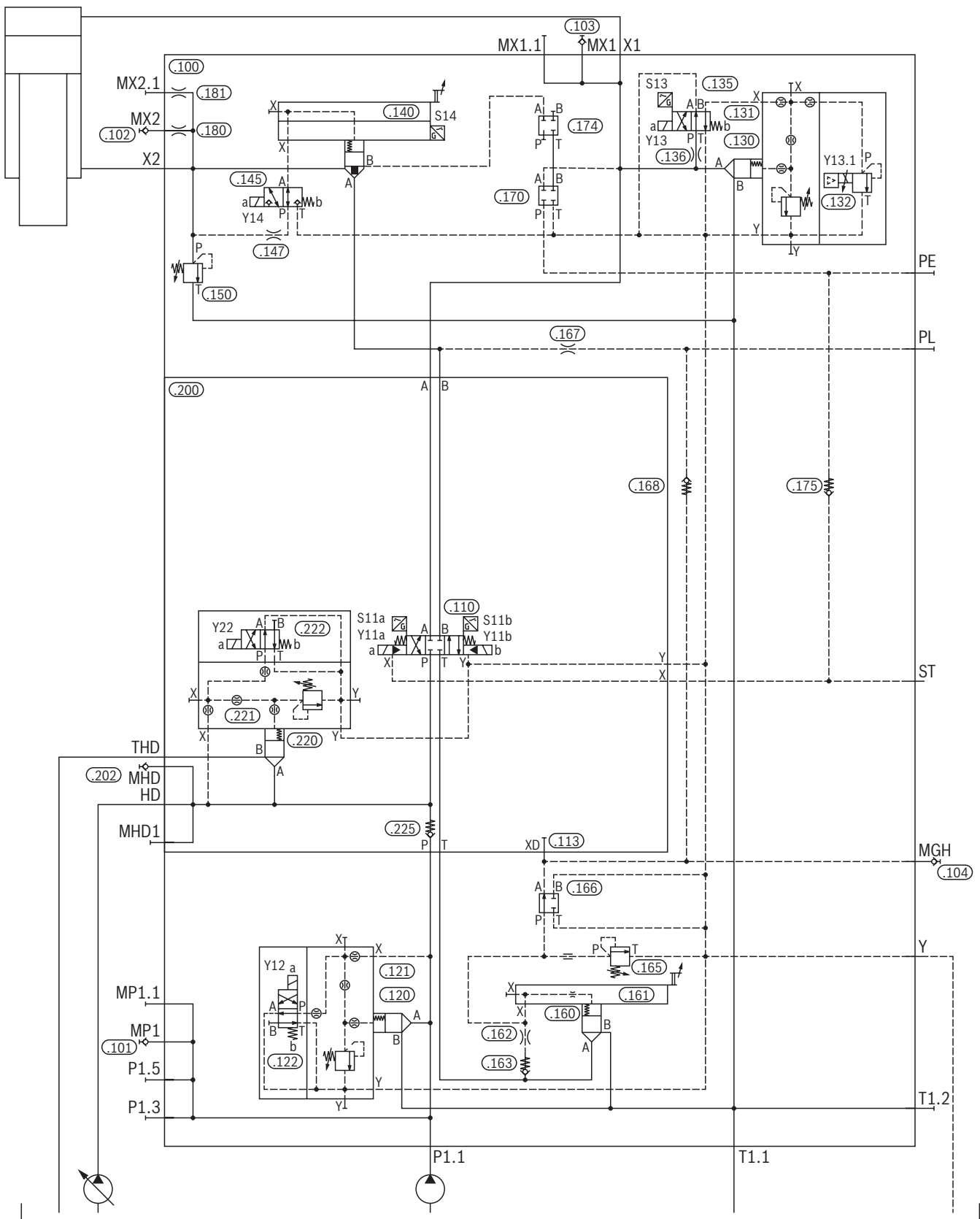
The pressure relief valve item 120/121 limits the pressure of the low-pressure motor pump station (hydraulic energy supply). At the pressure relief valve item 121, the maximum operating low-pressure is set. The on/off valve item 122 provides pilot control for the pressure relief valve item 120/121. The pressure relief valve item 120/121 is switched to depressurized circulation in the basic position. Energization of the solenoid Y12 causes the pressure set at the pressure relief valve item 121 to become effective.

#### Option HN – Item 220

The pressure relief valve consisting of the items 220/221 limits the pressure of the high-pressure motor pump station (hydraulic energy supply). The maximum operating high pressure is set at the pressure relief valve item 221. The on/off valve item 222 provides pilot control for the pressure relief valve item 220/221. The pressure relief valve item 220/221 is switched to depressurized circulation in the basic position. Energization of the solenoid Y22 causes the pressure set at the pressure relief valve item 222 to become effective. The check valve item 225 separates the high-pressure and low-pressure circuits



Operation with high- and low-pressure pumps: IH04CS-7X/...2-WEON-WEH000E-HN-G24



**Load-sensing: IH04CS-7X/...2-BE0N-TEM...E-LN-G24**

The load-sensing function is achieved together with the flow controller of the pump.

**Option B – Item 120**

The pressure relief valve consisting of the items 120/121 provides pressure limitation for the motor pump station (hydraulic energy supply). At the pressure relief valve item 121, the maximum operating pressure is set.

**Option LN – item 275 and 276**

The valve item 276 determines the operating mode of the pump:

- ▶ In the standby basic position, the flow controller pressure is effective and can be set. Also the pump is swiveled in. A pressure of 22 ... 25 bar favors the control quality at smaller velocities and saves the installation of a pilot oil pump.
- ▶ With energization of the solenoid Y27.1-AN, the load sensing function becomes effective:

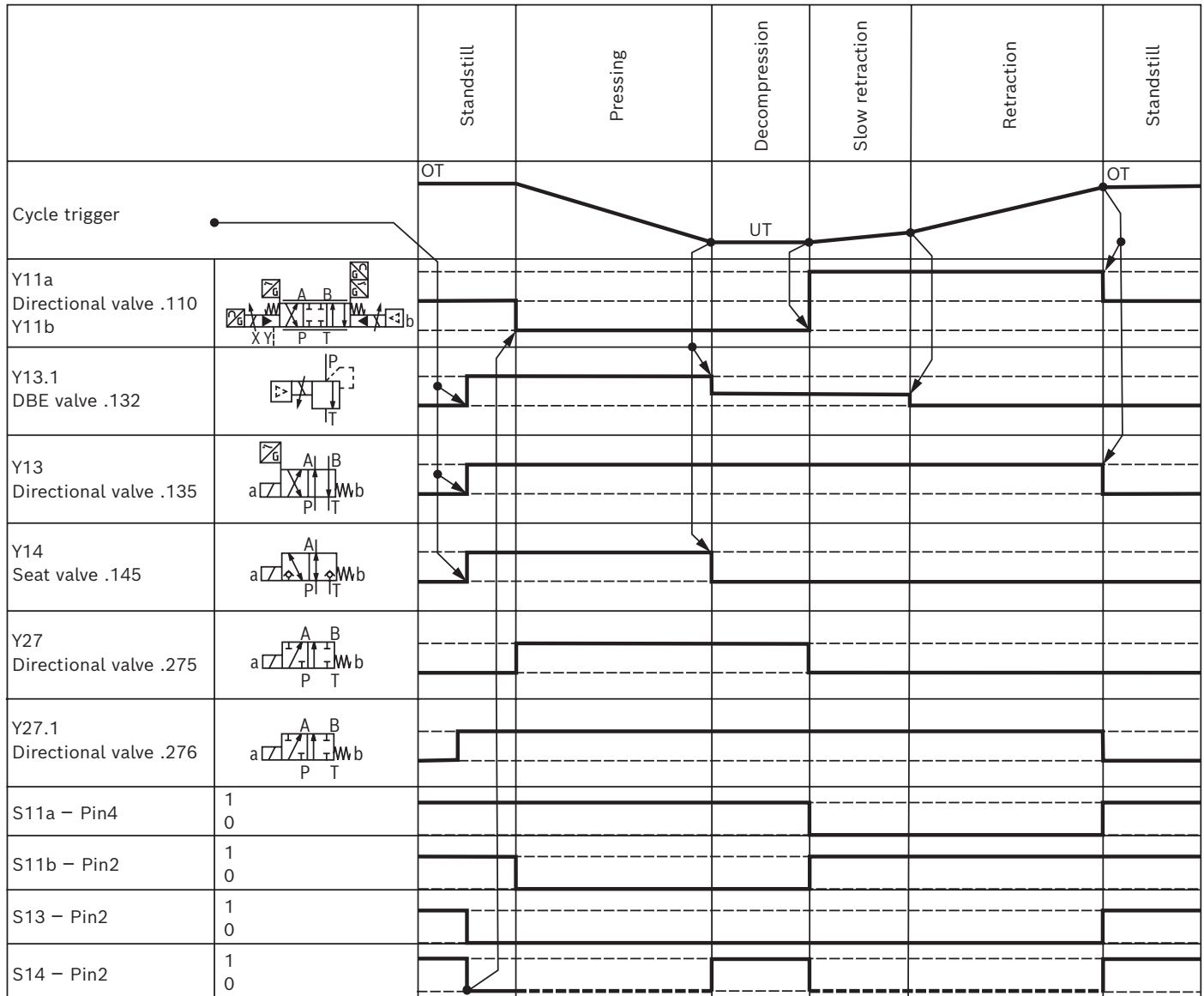
The effective pressure for load sensing selected with the valve item 275:

- Solenoid Y27 – OFF selects the pressure at port B of the proportional directional valve item 110.
- Solenoid Y27 – ON selects the pressure at port A of the proportional directional valve item 110.

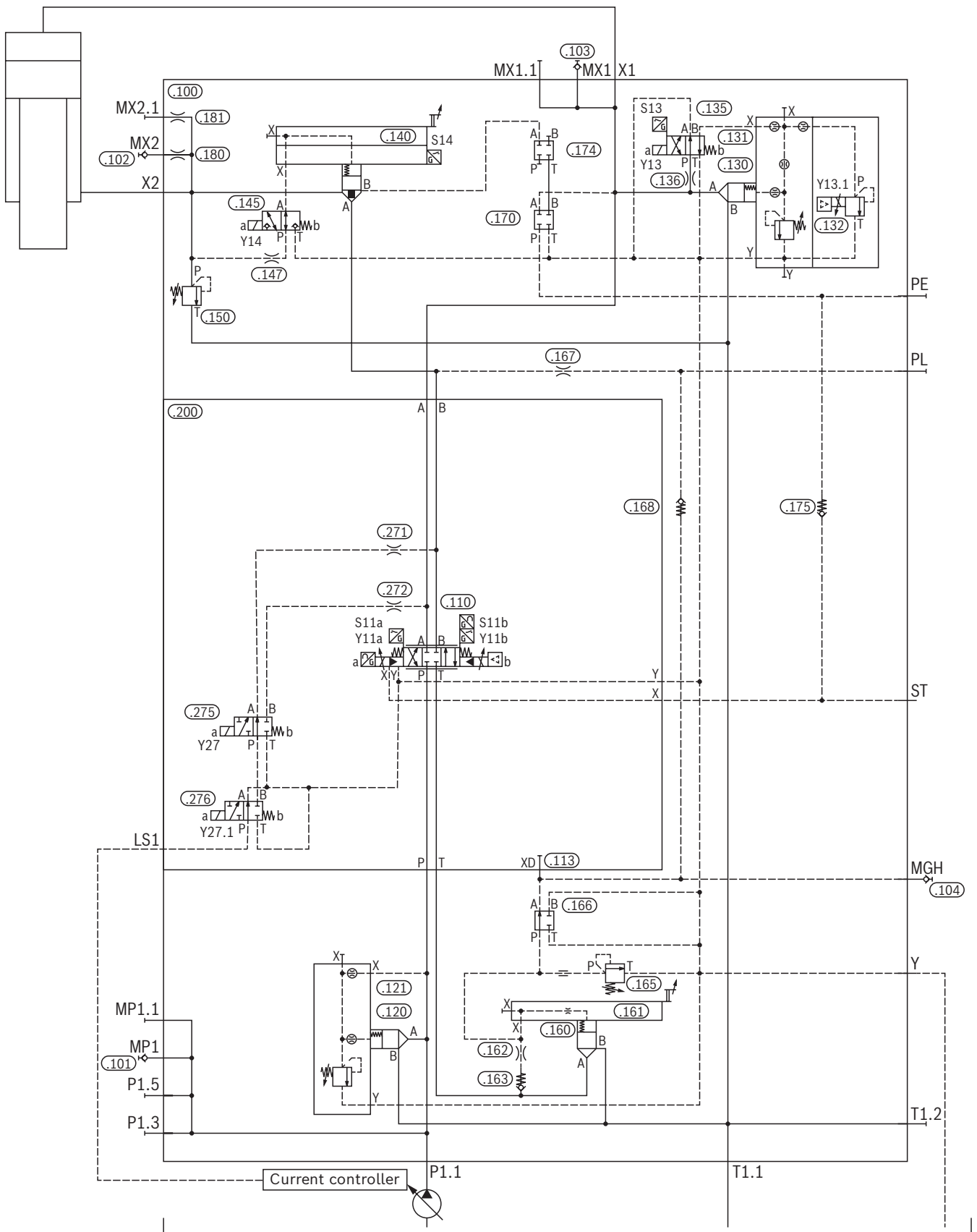
**Option TEM...E – Item 110**

The stepless flow adjustment of the pump and the movement direction of the cylinder piston are determined by the proportional directional valve item 110.

**Load-sensing: IH04CS-7X/...2-BE0N-TEM...E-LN-G24**



**Load-sensing: IH04CS-7X/...2-BE0N-TEM...E-LN-G24**



**High-response valve with zero overlap: IH04CS-7X/...3-WE3N-RDE...V-RN-G24****Option RDE...V – Item 110**

The stepless flow adjustment and the movement direction of the cylinder piston are determined by the high-response valve item 110. The highly dynamic high-response valve item 110 is recommended for alternating pressure, force, position and velocity controls and has a control spool with zero overlap.

**Option 3 – Item 105**

During the pressing process, the pressure relief valve item 195 compensates the load holding pressure on the annulus area side. The pressure relief valve item 195 is to be set so that the cylinder piston does not drop during standstill.

The valve item 196 provides pilot control for the rapid traverse phase and the load-holding pressure compensation:

- ▶ In basic position (Y19-OFF), the load holding pressure compensation takes effect via the pressure relief valve item 195
- ▶ With energization of the solenoid (Y19-ON), the rapid traverse phase via the 2-way cartridge valve item 190/192 without load holding pressure compensation takes effect. Using the stroke limitation at the logic cover item 191, the maximum rapid traverse velocity is set.

Retraction is realized via the check valve item 198.

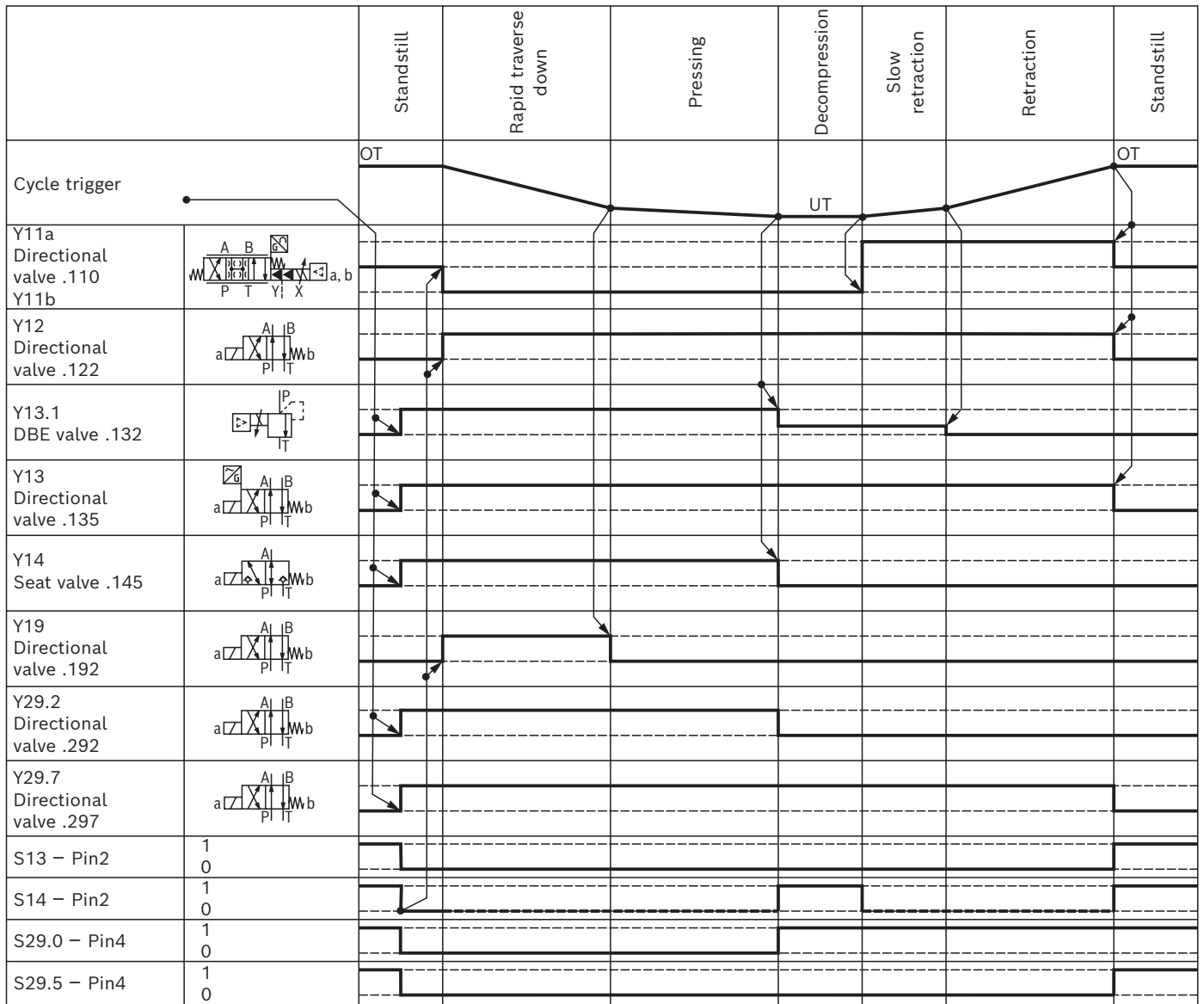
The pressure relief valve item 165 limits the pressure of the tank line item 110 and is to be set to the maximum pressure rating.

**Option RN – Item 290**

The energy separation against unwanted pressure build-up on the piston chamber side is realized by the 2-way cartridge valve item 290. By means of the position monitoring S29.0 it is monitored whether the basic position is reached in every pressing cycle. The directional valve item 292 (Y29.2-ON) unlocks the 2-way cartridge valve item 290. In basic position, the directional cartridge valve item 290 is closed.

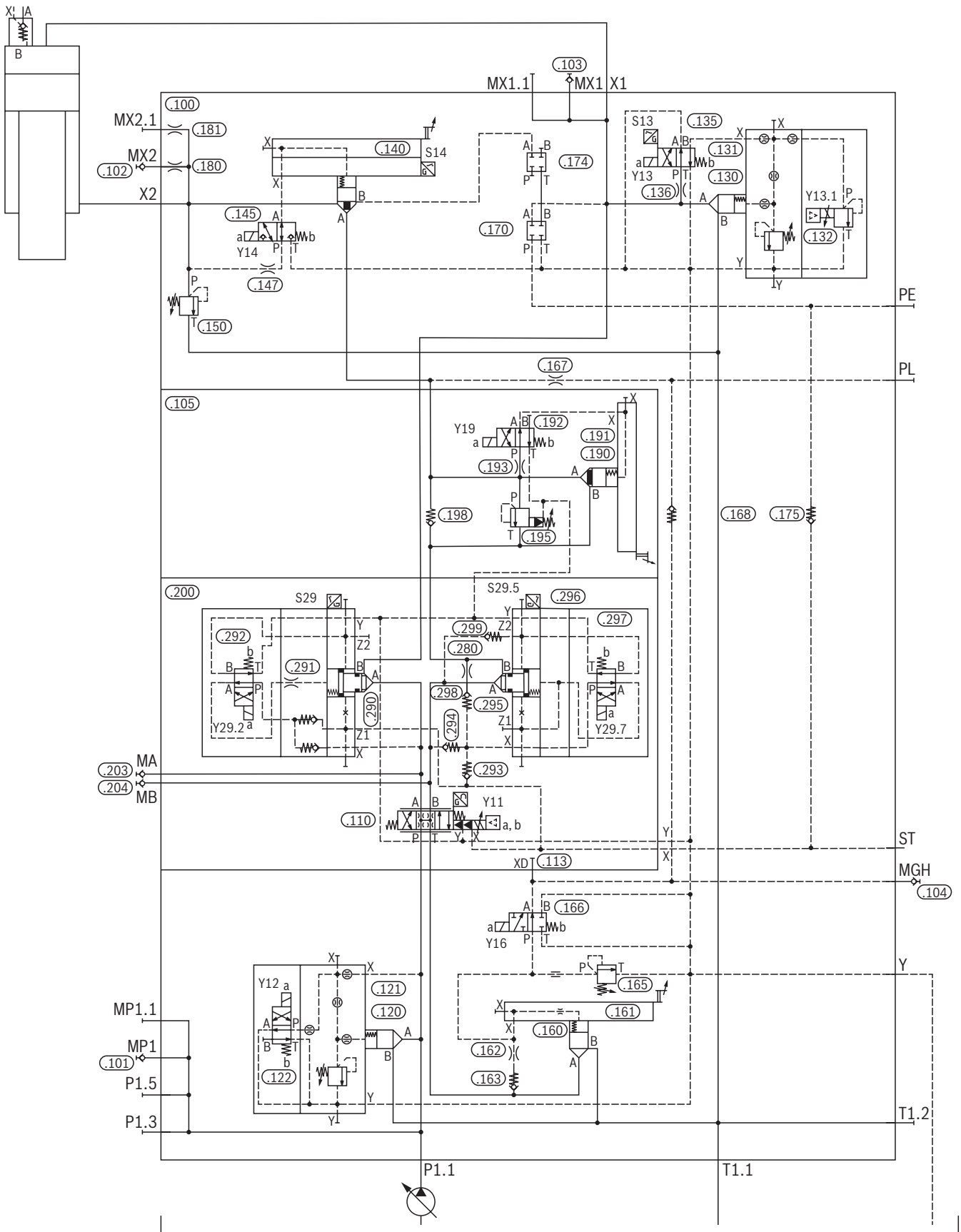
The 2-way cartridge valve item 295 holds the cylinder piston in position (see EN ISO 16092-3 section 5.3.7.2). By means of the position monitoring S29.5 it is monitored whether the basic position is reached in every pressing cycle. The directional valve item 297 (Y29.7-ON) unlocks the 2-way cartridge valve item 295. In basic position, the 2-way cartridge valve item 295 is closed.

### High-response valve with zero overlap: IH04CS-7X/...3-WE3D-RDE...V-RN-G24



Except for during decompression and slow retraction, the solenoid Y16 is switched permanently

### High-response valve with zero overlap: IH04CS-7X/...3-WE3N-RDE...V-RN-G24



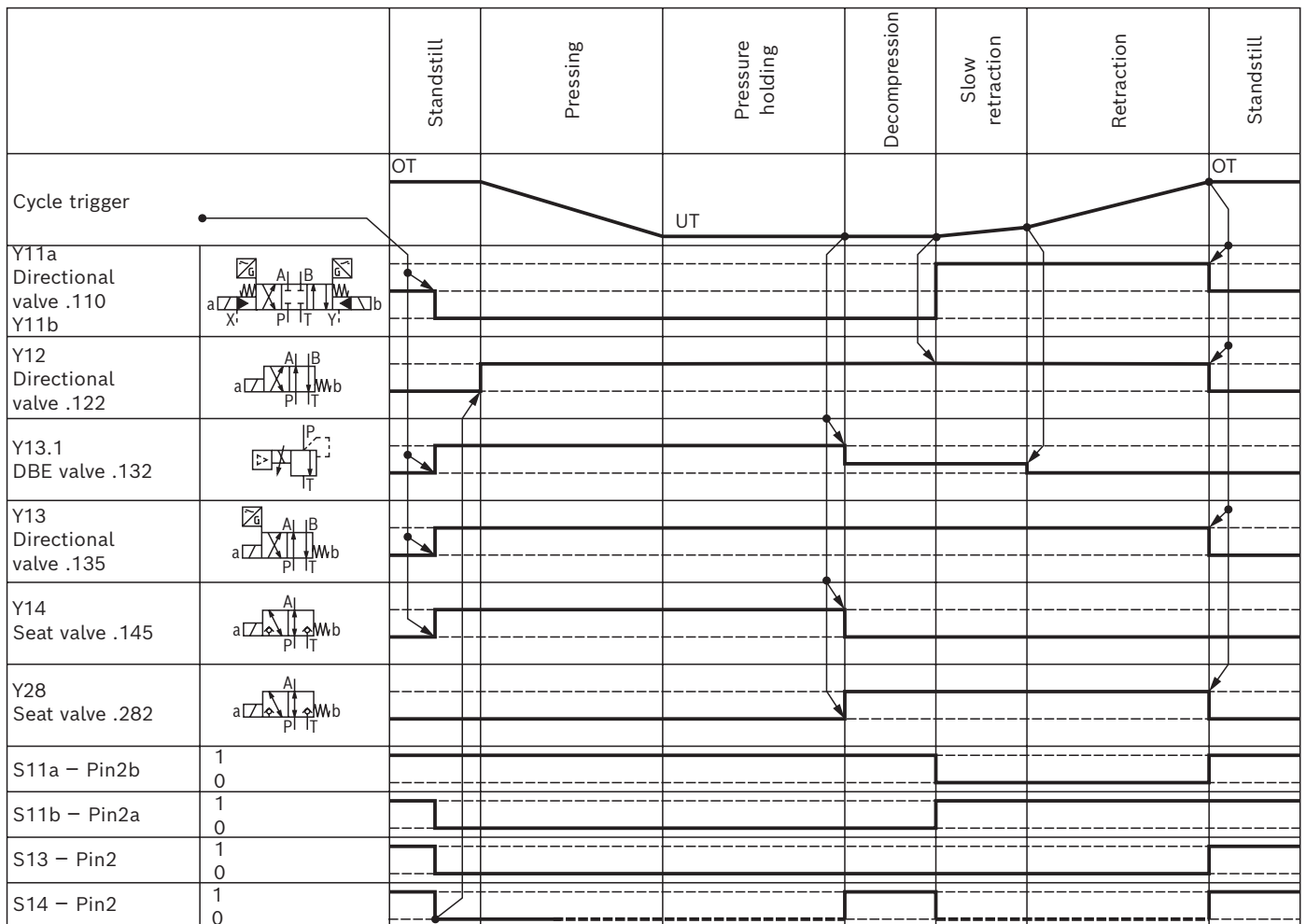
### Pressure holding on the piston chamber side: IH04CS-7X/...3-WE2N-WEH000E-XN-G24

#### Option 2 – Item 105

During the pressing process, the pressure relief valve item 195 compensates the load holding pressure on the annulus area side. The valve item 195 is to be set so that the cylinder piston does not drop during standstill. Retraction is realized via the check valve item 198. The pressure relief valve item 165 limits the pressure of the tank line item 110 and is to be set to the maximum pressure rating.

#### Option XN – Item 280

In the basic position, the 2-way cartridge valve consisting of the items 280/281 acts as a check valve. The pressure is built up on the piston chamber side by the cylinder up to the system pressure and then maintained in a leakage-free manner. Energization of the solenoid (Y28-ON) unlocks the 2-way cartridge valve item 280/281 at the valve item 282 and triggers the decompression.



Except for during decompression and slow retraction, the solenoid Y16 is switched permanently



## Accumulator operation: IH04CS-7X/...2-WE0N-TEM...E-SN-G24

### Option SN – Item 240

The on/off valve item 240 selects between pump operation (Y24 - OFF) and accumulator operation (Y24 - ON).

The 2-way cartridge valve consisting of item 243/244 shuts off the accumulator circuit. The seat valve item 245 provides pilot control of the 2-way directional valve item 243/244:

- ▶ In basic position (Y24.1 - OFF), the blocking is effective in both directions;
- ▶ With energization of the solenoid (Y24.1 – ON), the accumulator circuit takes effect.

The stroke limitation at the logic cover item 242 limits flow at the accumulator. Stepless flow adjustment is achieved via the proportional valve item 110.

The assembly item 246 to item 248 comprises all the equipment required according to EN 14359 for the safety of accumulators:

- ▶ The maximum pressure limitation is achieved by the type-examination tested pressure relief valve item 246
- ▶ The manual unloading is achieved using the rotary knob at the pressure relief valve item 246.
- ▶ The electrical unloading is achieved using the orifice

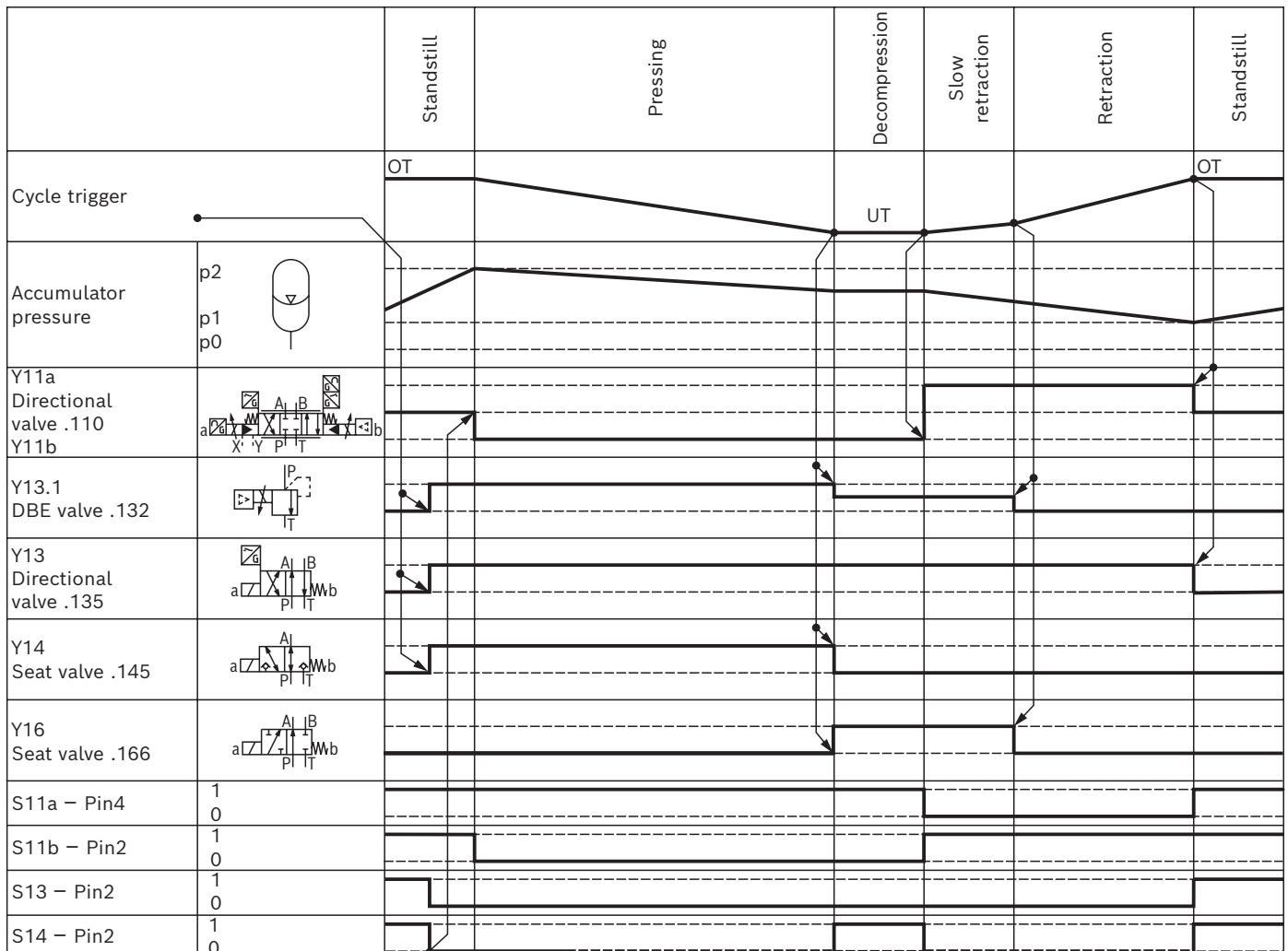
and the seat valve item 247. In the energized condition (Y24.2 - ON), the pressure set at the pressure relief valve item 121 takes effect.

- ▶ The charge state of the accumulator is visually indicated by the pressure gauge item 248 with red marking of the relief pressure.

#### **Notice:**

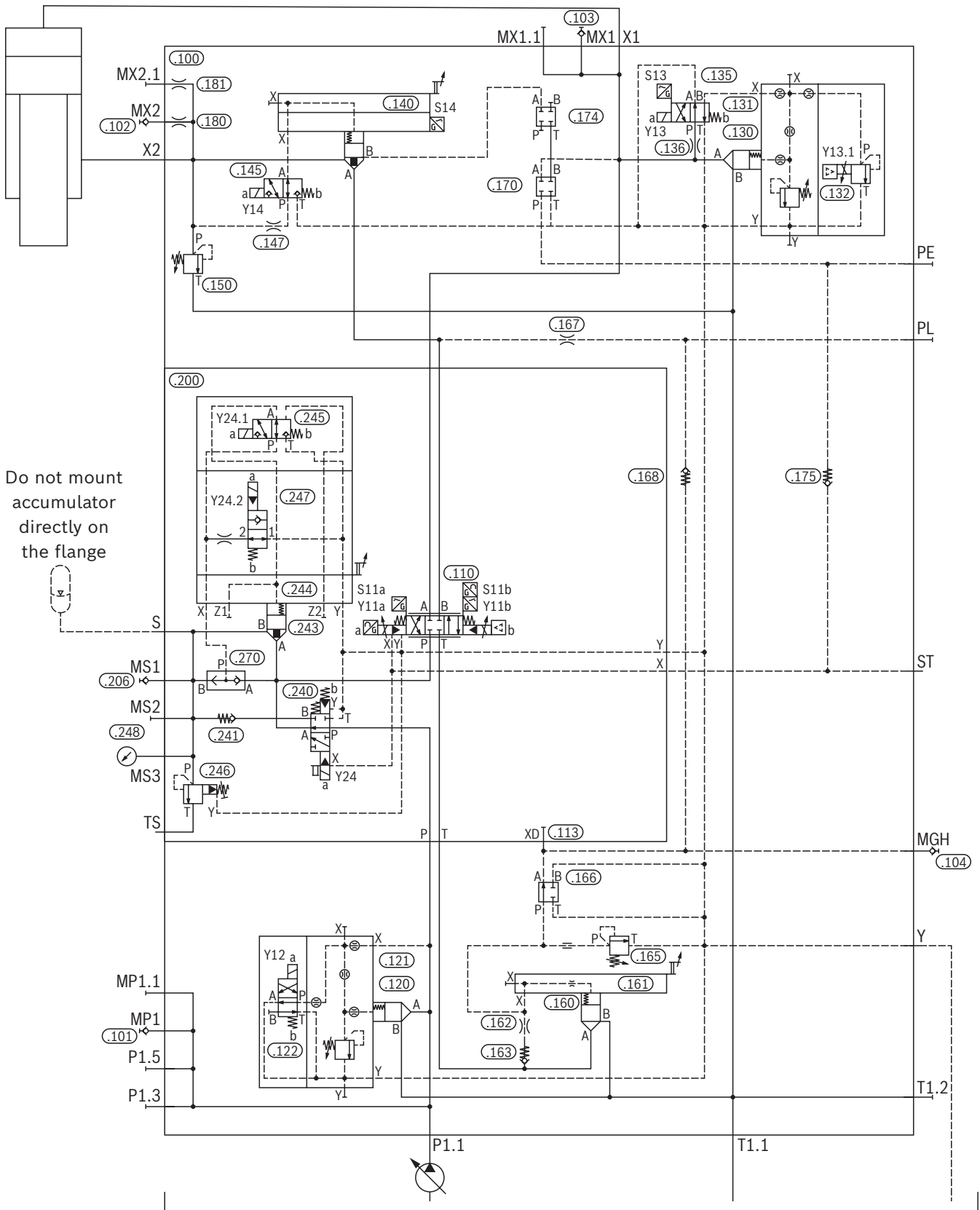
In the case of sizes 10 and 16, the adequacy of the accumulator safety valve item 246 for the maximum pump volume must be checked based on the applicable valve data sheets. The maximum flow of the accumulator safety valves is only valid for a counter pressure of 0 bar in the discharge line. At higher counter pressures, the maximum flow is reduced according to the specifications in the applicable valve data sheets.

NG IH04	Nominal flow	Item 246	Data sheet
10	140 l/min	R900769372 (DBDH10K1X/330)	25402
16	300 l/min	R901265679 (DB20K1-1X/330YE)	25818



The solenoids Y12, Y24, Y24.1 and Y24.2 are permanently switched.

**Accumulator operation: IH04CS-7X/...2-WE0N-TEM...E-SN-G24**



### Slide cushion: IH04CS-7X/...2-WE0N-WEH000E-ZN-G24

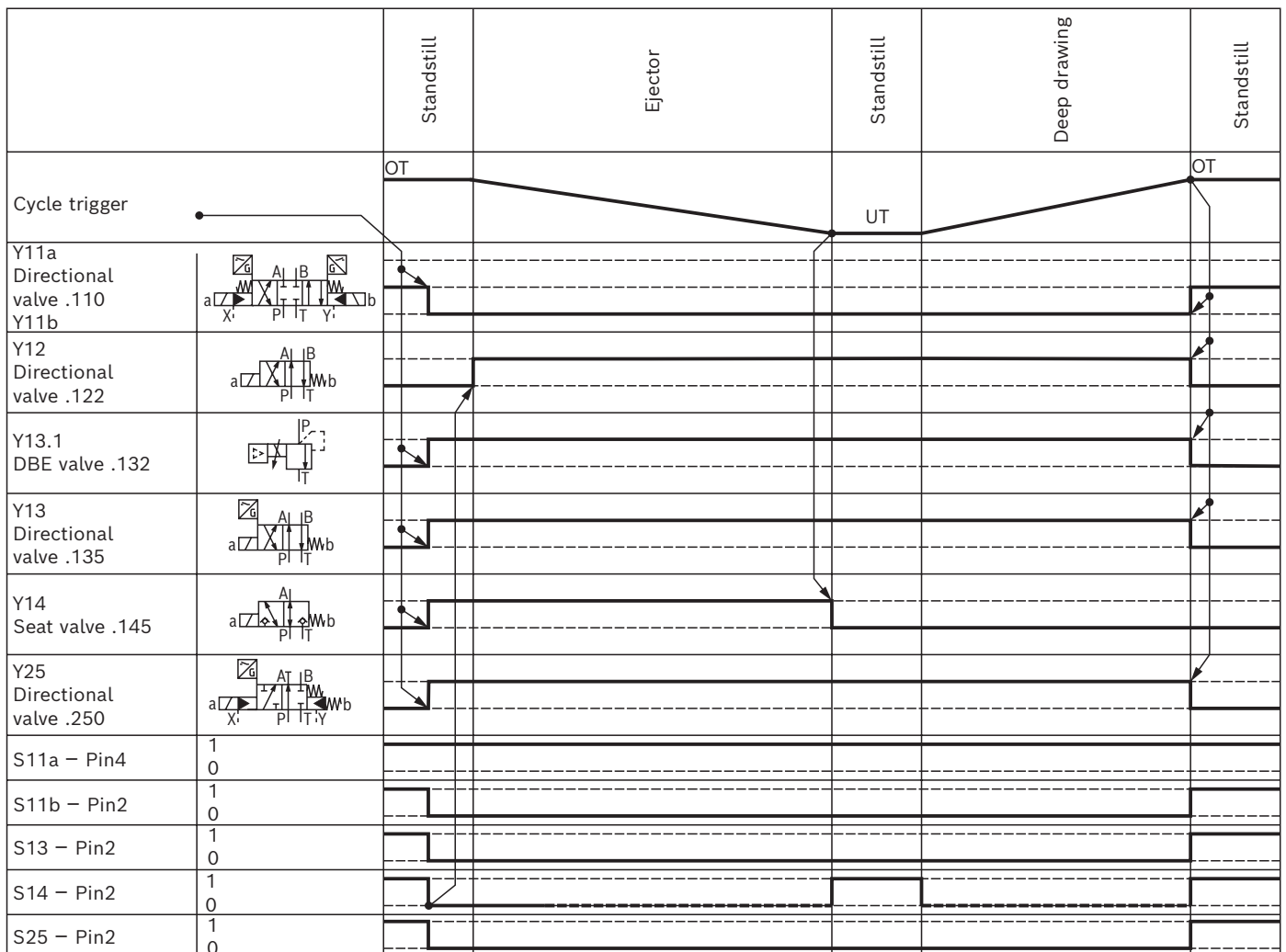
#### Option ZN – Item 250

The slide cushion function is always performed when the directional valve item 110 is switched in parallel. The on/off valve item 250 (Y25-ON) controls the connection between piston chamber and annulus chamber continuously during the drawing process and refills the annulus chamber.

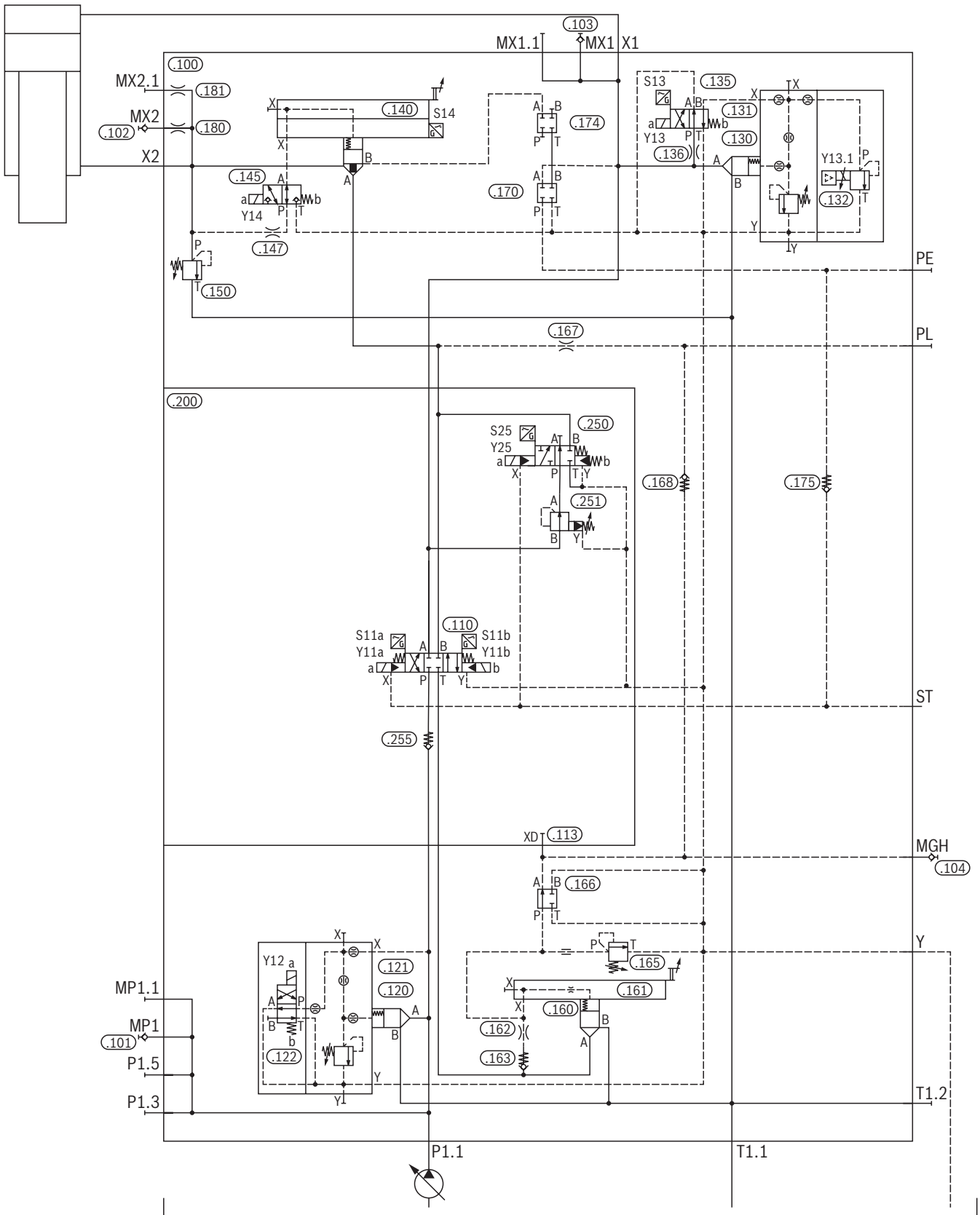
In this way, cavitation of the annulus chamber is actively prevented. By means of the electric position monitoring S25 it can be monitored whether the basic position is reached. The pressure reducing valve item 251 serves as maximum pressure adjustment for refilling of the annulus chamber (e.g. 10 bar)

**Notice:**

The slide cushion is a separate cylinder axis which is arranged in the press ram and requires its own press module with the extension module ZN. During pressing process, the slide cushion is passively displaced.



Slide cushion: IH04CS-7X/...2-WEON-WEH000E-ZN-G24



**Set-up by own weight with prefill valve (greater than 10 mm/s, PLe/Cat. 4):**  
IH04CS-7X/...2-EB1N -WEH000E-NN-G24-002

**Option E – Item 120**

The pressure relief valve consisting of the items 120/121 provides pressure limitation for the motor pump station (hydraulic energy supply). At the pressure relief valve item 121, the maximum operating pressure is set. The proportional pressure relief valve item 122 provides pilot control of the pressure relief valve item 120/121 and determines the system pressure (e.g. press force, decompression):

- ▶ When the set pressure is exceeded, the pressure relief valve item 120/121 will open to the tank.
- ▶ When the set pressure is no longer reached, the pressure relief valve item 120/121 will close.

With a control signal (Y12) of 0V at the proportional pressure relief valve item 122, the pressure relief valve item 120/121 will switch to depressurized circulation.

**Option B – Item 130**

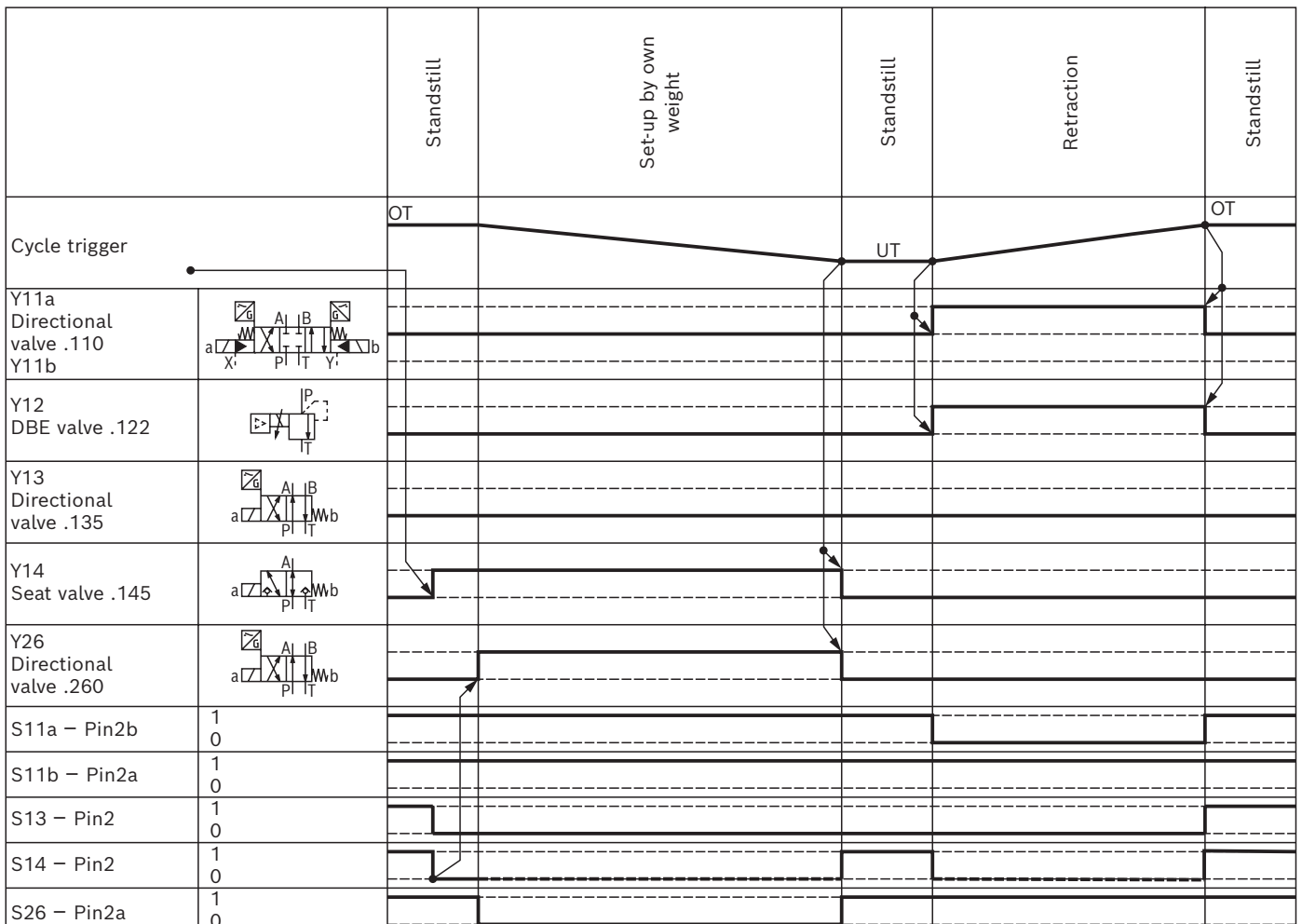
The pressure relief valve consisting of the items 130/131 limits the pressure on the piston chamber side of the cylinder. At the pressure relief valve item 131, the maximum system pressure is set.

**Option 002 – Item 260**

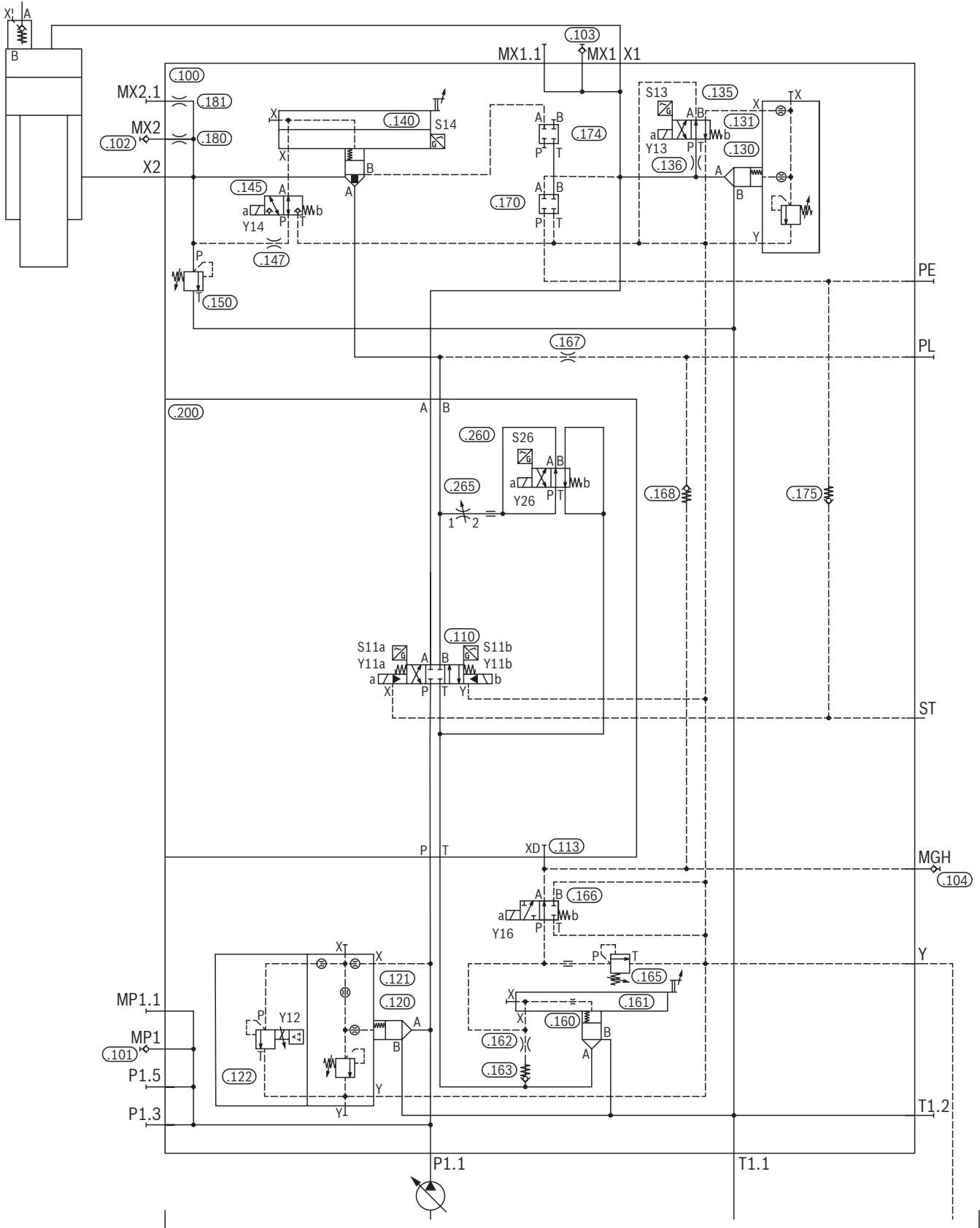
The on/off valve item 260 initiates the closing movement by own weight. Set-up is done in creep speed by own weight. Thereby, the oil is sucked in via the prefill valve from the tank into the piston chamber. By means of the position monitoring S26 it is monitored whether the basic position is reached at the end of the closing movement.

The manually adjustable throttle valve item 265 determines the closing speed.

**Notice:**  
This function may only be used with active/closed safety devices and not for set-up with a safe reduced velocity of less than 10 mm/s.



**Set-up by own weight with prefill valve (greater than 10 mm/s, PLe/Cat. 4):**  
 IH04CS-7X/...2-EB1N-WEH000E-NN-G24-002



**Basic functions according to safety category 1 (ISO 13849-PLc):**  
IH04CN-7X/...1-WU0N-WEH000E-NN-G24

**Option WEH000E – Item 110**

The movement direction of the cylinder piston is determined by the directional valve item 110:

- ▶ The cylinder piston is extended with the control signal Y11b.
- ▶ The cylinder piston is retracted with the control signal Y11a.

**Option U – Item 130**

The pressure relief valve consisting of the items 130/131 limits the pressure on the piston chamber side of the cylinder. The on/off valve item 132 with the control signal Y13.1 provides pilot control of the pressure relief valve item 130/131:

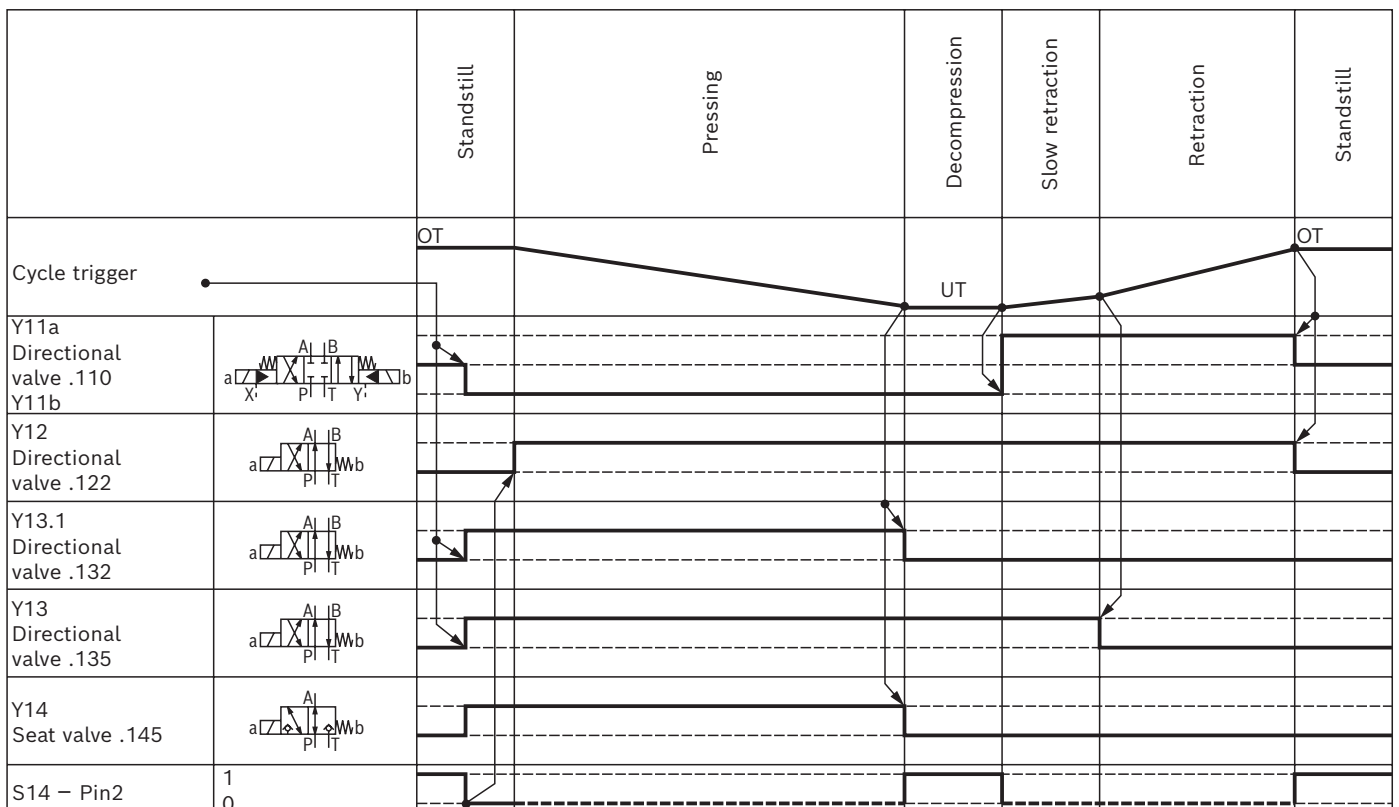
- ▶ In basic position, the piston chamber preload DB2 set at the pressure relief valve item 131 takes effect (e.g. during slow retraction with spring tool or decompression).
- ▶ Energization of the solenoid Y13.1 causes the pressure DB1 set at the pressure relief valve item 131 to become effective.

**Depressurized circulation in the piston chamber – Item 135**

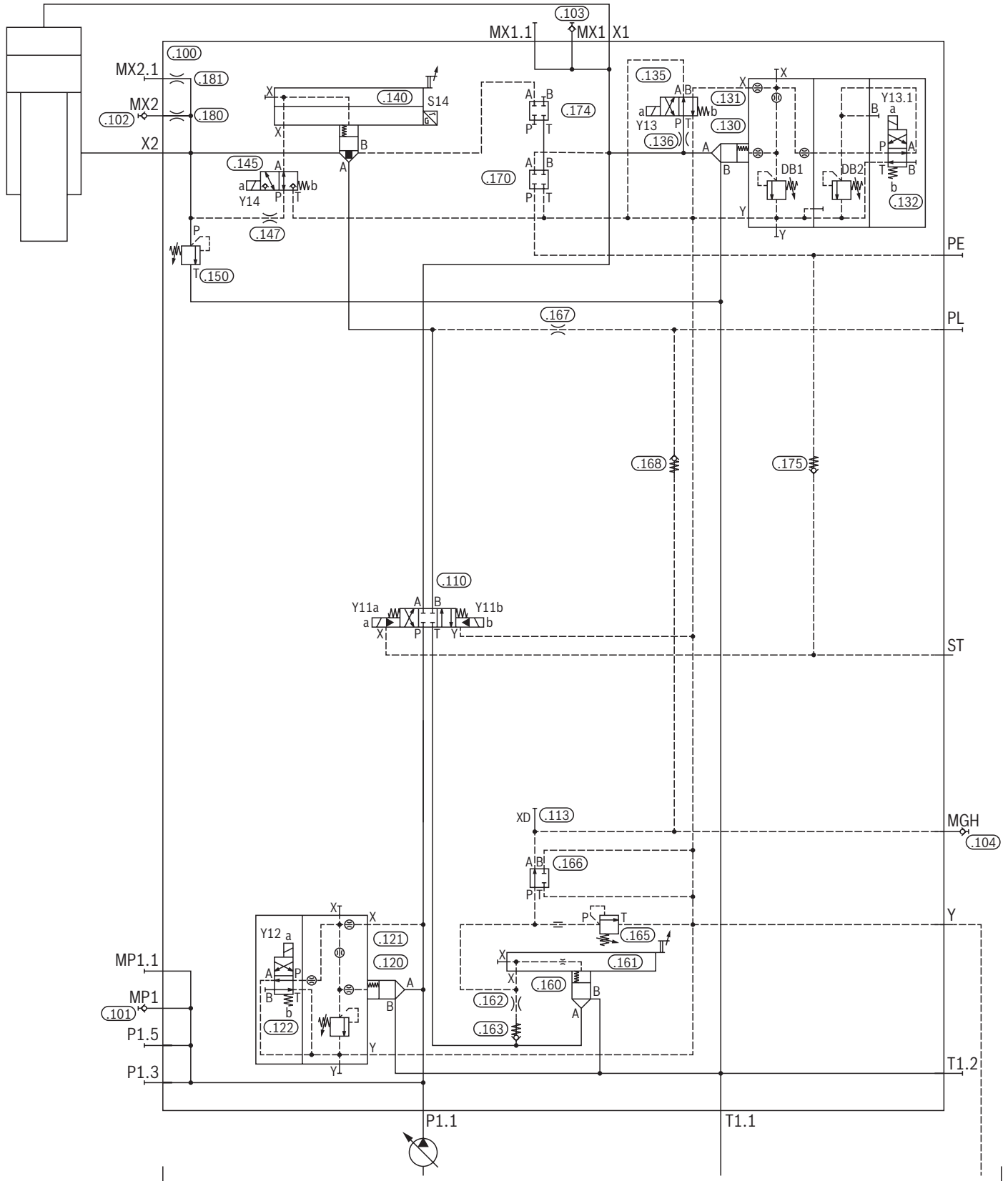
In its basic position, the pressure relief valve item 130/131 switches to depressurized circulation. Energization of the solenoid Y13 causes the pressure stage selected at the on/off valve item 132 to become effective.

**Restraint valve in the annulus area – Item 140**

The 2-way cartridge valve item 140 holds the cylinder piston in position (see EN ISO 16092-3 section 5.3.7.2). During load holding/retraction, the valve item 140 acts as a check valve and during extension as a switchable isolator valve. By means of the position monitoring S14 it is monitored whether the basic position is reached in every pressing cycle. Item 145 unlocks the 2-way cartridge valve item 140 during extension. By means of the electric position monitoring S14, opening of the 2-way cartridge valve item 140 at the beginning of rapid traverse is monitored to prevent pressure intensification in the annulus area.



**Basic functions according to safety category 1 (ISO 13849-PLc):**  
 IH04CN-7X/...1-WU0N-WEH000E-NN-G24



## **Safe reduced velocity less than 10 mm/s (ISO 13849-PLd):** IH04CS-7X/...1-WE0D-WEH000E-NN-G24

- ▶ NG10 ... NG35
- ▶ Set-up with reduced velocity (less than 10 mm/s) is achieved by means of a hold-to-run control device (ISO 6092-1 Section 5.3.2.1 h, ISO 16092-3, Section 5.3.2) and fixed orifice (item 172) (0.8 mm at the factory).

### **Option D – Item 170**

The seat valve item 174 (Y17) ensures safe opening from the annulus area to the tank. By means of the electric position monitoring S17 it can be monitored whether the basic position is reached.

The movement direction of the cylinder piston is determined by the directional valve item 170. The cylinder piston is extended with the control signal Y17b. Lowering is effected by own weight via a fixed orifice item 172.

The orifice item 172 has to be adjusted to the load holding pressure and the closing spring (at the factory 2 bar) of the installation kit item 130 so that the closing velocity is limited to a maximum of 10 mm/s.

Simultaneously, the piston chamber is filled with oil by the pilot oil circuit or externally, via port PE.

The closing spring of the pressure relief valve item 130/131 limits the pressure on the piston chamber side. Set-up under pressure without velocity limitation is only allowed after contact with the workpiece.

The pressure relief valve consisting of the items 130/131 serves the system pressure limitation on the piston chamber side. The proportional pressure relief valve item 132 provides pilot control of the pressure relief valve item 130/131.

The cylinder piston is retracted with the control signal Y17a. The oil supply is always available and is provided by the pilot oil circuit or externally, via port PE.





## General information

### Port sizes

Port	IH04C-7X/10	IH04C-7X/16	H04C-7X/25	IH04C-7X/32	IH04C-7X/35
P1.1 ... P1.4	G1	2 x SAE 1 ¼-6000	2 x SAE 1 ½-6000	4 x SAE 1 ½-6000	4 x SAE 1 ½-6000
P1.5, ST	G¾	G½	G½	G¾	G¾
P1.6, P1.7	-	-	-	-	2 x DN80
T1.1, T1.2	2 x G1 ½	2 x SAE 2-3000	2 x SAE 2 ½-3000	2 x SAE 3-3000	SAE 5-3000
X1, X11, X12	G1 ¼	SAE 1 ½-6000	SAE 2-6000	DN50	DN80
X2	G1	SAE 1 ¼-6000	SAE 1 ½-6000	DN50	DN80
Y	G½	G½	G½	G1	G1
PE	G¼	G¼	G¼	G¼	G¾
PL	G¼	G¼	G¼	G¼	G¾
HD	G¾	G1	G1 ½	-	-
THD	G1	G1 ¼	G1 ½	-	-
S	G1	SAE 1 ¼-6000	SAE 1 ½-6000	DN50	DN80
TS	G1 ½	SAE 2-3000	SAE 2 ½-3000	SAE 3-3000	SAE 4-3000
LS1	G¼	G¼	G¼	G¼	G¼
MX12	G¾	G¾	G¾	G¾	G½

### Connection flanges

Port size	Material no.	Designation
SAE1 ¼ – 6000 psi	R900012346	FLANGE SAE11/4 H-38.0 X 6.0
SAE1 ½ – 6000 psi	R900015663	FLANGE SAE11/2 H-48.3 X 8.0
SAE2 – 6000 psi	R900012944	FLANGE SAE2 H-60.3 X 10.0
SAE2 – 3000 psi	R900012939	FLANGE SAE2 S-60.3 X 3.6
SAE2 ½ – 3000 psi	R900012336	FLANGE SAE21/2 S-76.1 X 3.6
SAE3 – 3000 psi	R900012940	FLANGE SAE3 S-88.9 X 3.6
SAE5 – 3000 psi	R900012338	FLANGE SAE5 S-139.7 X 4.0
DN50 – PN320	R900049122	FLANGE FA 50-4 / 76.1 X 12.5
DN50 – PN400	R900224176	FLANGE FA 50-5 / 76.1 X 14.2
DN80 – PN320	R900211240	FLANGE FA 80-4 / 114.3 X 17.5
DN80 – PN400	R900761506	FLANGE FA 80-5 / 133.0 X 25.0

## Accessories

### Pressure gauge

Designation	Material number	Data sheet
ABZMM 63- 160BAR/MPA-U/V-G	R900077650	50205
ABZMM 63- 250BAR/MPA-U/V-G	R900771208	
ABZMM 63- 400BAR/MPA-U/V-G	R900053460	

### Measuring couplings, measuring hoses

Designation	Material number	Data sheet
MEASURING COUPLING MCS20-SDS-E-G1/4-ST3&	R900009090	-
MEASURING HOSE DN2-630/MCS20-MOS-G1&	R901360313	

### Pressure sensors

Designation	Material number	Data sheet
HM 20-2X/160-C-K35-N	R901381345	30272
HM 20-2X/160-H-K35-N	R901381347	
HM 20-2X/400-C-K35-N	R901456334	
HM 20-2X/400-H-K35-N	R901466598	
HEDE10-3X/100/1/-GI-K35-0	R901425473	30277
HEDE10-3X/250/1/-GI-K35-0	R901425474	
HEDE10-3X/400/1/-GI-K35-0	R901425475	
HEDE12-1X/100-2-K35-V	R901507473	30340
HEDE12-1X/250-2-K35-V	R901507474	
HEDE12-1X/400-2-K35-V	R901507477	

### Mating connectors

Designation	Material number	Data sheet
MATING CONNECTOR 3P Z5L1 M 24V SPEZ (K4 connector)	R901017026	08006
MATING CONNECTOR 7P Z31 BF6-3PG11KSPEZ (7-pole, 6+PE)	R900021267	
MATING CONNECTOR 4P Z24 STRAIGHT PG7 1& (M12, 4-pole)	R900773042	
HEDE10-3X/100/1/-GI-K35-0	R900752278	

### Pipe check valve (mountable in T1.1/T1.2, flow direction discharge)

Designation	Material number	Data sheet
CHECK VALVE RV L28 G1 PE-0.5 &	R901115447	-
CHECK VALVE RV L42 G11/2 PE-0.5 &	R901115450	

### Pipe check valve (mountable in X/ST, flow direction supply)

Designation	Material number	Data sheet
CHECK VALVE RZ S08 G 1/4 PE-0.5 &	R901115541	-
CHECK VALVE RZ S16 G 1/2 PE-0.5 &	R901115545	
CHECK VALVE RZ S20 G 3/4 PE-1.0 &	R901115556	

### Plug screws

Designation	Material number	Data sheet
PLUG SCREW DCCS10001-G1/4A-ST+E&	R913011601	-
PLUG SCREW DCCS10001-G3/8A-ST+E&	R913011602	
PLUG SCREW DCCS10001-G1/2A-ST+E&	R913011603	
PLUG SCREW DCCS10001-G3/4A-ST+E&	R913011604	
PLUG SCREW DCCS10001-G1A-ST+EP-&	R913011605	
PLUG SCREW DCCS10001-G1 1/4A-ST&	R913011606	
PLUG SCREW DCCS10001-G1 1/2A-ST&	R913011607	

## Recommended pump versions

### IH04CS-7X/...-NN, EN, DN, HN, RN, XN

Pump version	Data sheet	Features
A4VSO...LR2	92050	With mechanical power limitation
A4VSO...LR2G	92064	With mechanical power limitation and remote-controlled pressure cut off <sup>1)</sup>
A4VSO...LR2D		With mechanical power limitation and manual pressure cut off
A4VSO...LR2N (up to 350 bar)		With mechanical power limitation and hydraulic stroke adjustment, proportional <sup>2)</sup>
A4VSO...LR2NT (up to 355 ccm)		With mechanical power limitation and hydraulic stroke adjustment with integrated proportional valve <sup>3)</sup>
A4VSO...HS5(P) <sup>4)</sup>	92050	Power, pressure and flow control with servo valve
A4VSO...HS5(P)V <sup>5)</sup>	92076	Power, pressure and flow control with servo valve and with internal set pressure supply
A4VSO...HS5(P)M		Power, pressure and flow control with servo valve and for use under fluid
A4VSO...HS5E(P) <sup>4)</sup> (up to 350 bar)		Power, pressure and flow control with servo valve and digital on-board electronics
A4VSO...HS5E(P)V <sup>5)</sup> (up to 355 ccm)		Power, pressure and flow control with servo valve, digital on-board electronics and internal set pressure supply
A15VSO...LR		With mechanical power limitation
A15VSO...LRDRE2...A <sup>6)</sup>		With mechanical power limitation and manual pressure cut off
A15VSO...LRDRE2...B <sup>7)</sup>		With mechanical power limitation and manual pressure cut off
A15VSO...LRDGE2...A <sup>6)</sup> (up to 350 bar)	92802	With mechanical power limitation and remote-controlled pressure cut off <sup>1)</sup>
A15VSO...LRDGE2...B <sup>7)</sup> (up to 280 ccm)		With mechanical power limitation and remote-controlled pressure cut off <sup>1)</sup>
SYHDFED <sup>5)</sup> (up to 280 bar) (up to 140 ccm)	30030	Power, pressure, and flow control with fieldbus interface and speed variability
SY(H)DFEF <sup>5)</sup> (up to 350 bar) (up to 355 ccm)	30035	Power, pressure, and flow control with fieldbus interface
HS5E(n) <sup>5)</sup> (up to 350(450) bar) (up to 1000 ccm)	92050	Power, pressure and flow control with field bus interface and speed variability
PGH	10227	Fixed displacement with speed variability <sup>8)</sup> Up to 350 bar and up to 250 ccm

<sup>1)</sup> Separate order DBETE (data sheet 29263)

<sup>2)</sup> Separate order 3DREPE6A-2X/45...A1

<sup>3)</sup> Only suitable for motor design B35

<sup>4)</sup> External pilot oil supply required

<sup>5)</sup> Internal pilot oil supply for pressure control above 20 bar, with preload block below 20 bar

<sup>6)</sup> Electric stroke adjustment via integrated proportional valve. Internal pilot oil supply for an operating pressure of more than 20 bar.

<sup>7)</sup> Electric stroke adjustment via integrated proportional valve. External pilot oil supply from 30 to 50 bar required for an operating pressure of less than 20 bar.

<sup>8)</sup> Asynchronous motor MOT-FC and frequency converter EFC5610, instructions DE: R911369847, EN: R912005854

## Recommended pump versions

### Pump versions for IH04CS-7X/...TEM...E-LN

Pump version	Data sheet	Features
A4VSO...LR2S	92064	350 bar / up to 355 ccm
A15VSO...LRDRS0/10 A15VSO...LRDRS0/11	92800/ 92801	350 bar / up to 280 ccm
A10VSO...DFLR/31 <sup>1)</sup>	92711	280 bar / up to 140 ccm
A10VSO...LA...DS/32 <sup>1)</sup>	92714	280 bar / up to 180 ccm

The pumps are equipped with mechanical power limitation, load-sensing and remote-controlled pressure cut off.

<sup>1)</sup> With DFLR and LADS controllers, remove the orifice in the X adapter at the pump (flow controller).

### Pump versions for IH04CS-7X/...SN

Pump version	Data sheet	Features
A4VSO...DFR1 A4VSO...DP	92050/ 92060	350 bar / up to 355 ccm
A15VSO...DP/10 A15VSO...DP/11	92800/ 92801	350 bar / up to 280 ccm
A10VSO...DFR1/31	92711	280 bar / up to 140 ccm
A10VSO...DRS/32	92714	280 bar / up to 180 ccm

For the pressure remote control, separate order DBETE (data sheet 29263).

#### Notice:

These pump versions can be used for pressure holding on the piston chamber side without extension module **XN**.

## Further information

- ▶ Mating connectors and cable sets for valves and sensors Data sheet 08006
- ▶ On/off valves with spool position monitoring Data sheet 24830
- ▶ 4/3 proportional directional control valves, direct operated, with integrated control electronics, electrical position feedback, and monitoring of the spool position, with type 4WREEM test certificate Data sheet 29064
- ▶ 4/2, 4/3 proportional directional valve, pilot-operated, without electric position feedback, without/with integrated Electronics (OBE), with spool position indicator Data sheet 29117
- ▶ 2-way cartridge valves with spool position monitoring Data sheet 21015
- ▶ Proportional pressure relief valve Data sheet 29166
- ▶ Pressure relief valve, direct operated Data sheet 25402
- ▶ Power regulators LR2, LR3 and LR2N for variable displacement pump A4VSO Data sheet 92064
- ▶ Axial piston variable displacement pumps A15VSO, A15VLO, series 12 Data sheet 92802
- ▶ Axial piston variable displacement pump A10VO, series 52 and 53 Data sheet 92703
- ▶ Axial piston variable displacement pump A10VSO Data sheet 92714
- ▶ Control and adjustment systems HM, HS, HS5 and EO Data sheet 92076
- ▶ Digital control electronics for axial piston pumps Data sheet 30237
- ▶ Controllers DR, DP, FR and DFR Data sheet 92060

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