

P417 Pneumatic Field Controller



P417 pneumatic controllers are complete pneumatic control stations and, in conjunction with transmitters, are suitable for all control applications in process plants, particularly for field mounting. Field controllers are also available without an indicator.

FEATURES

- Same basic instrument for field / panel mounting
- Aluminium die-cast housing
- Protection class IP54 or IP65
- Well-established cross-bellows control system
- Set point, measured value and output indication
- Versions for master and slave control
- Push-buttons for manual / auto transfer
- Bumpless manual / auto transfer
- Limiting of controller output
- External feedback
- Field controller changeover relay
- Mode switching
- Operating point set internally / externally
- Function altered by interchanging standard modules
- Service label
- Explosion Protection: II 2G c IIC T4/T6

TECHNICAL DATA ¹⁾**Complete instrument**

Measured value x,	
Set point w and	
Output y	0.2 to 1.0 bar / 3 to 15 psi / 20 to 100 kPa
Supply air	1.4 ± 0.1 bar / 20 ± 1.4 psi / 140 ± 10 kPa
Inherent air consumption ^{2) 3)}	≤ 500 l/h
Load effect ²⁾	
(measured at 0.6 bar)	deviation -3 % for 1200 l/h delivered flow, deviation +3 % for 550 l/h exhausted flow
Max. air output ²⁾	+1400 l/h, -1050 l/h

Housing

Front dimensions	144 x 192 mm
Front finish	door enamelled grey to RAL 7000, with lock
Service label	50 x 13 mm, replaceable

Mounting

Type of mounting	Wall / panel mounting
Pneumatic connection	Internal thread (see dimensions on page 5)
Mounting position	NL 90 ± 5 °, specify other positions with order

Ambient conditions

Ambient temperature	-25 to +70 °C
Relative humidity	≤ 100 %
Condensation	permitted
Transport and storage temperature	-30 to +70 °C
Protection class	IP 54, IP65
The device can be operated at a class D ₁ location as per IEC 654, Part 1.	

Materials

Housing, with door	aluminium, with DD enamel, grey RAL 7000
Connection block for wall / panel mounting	aluminium, with DD enamel, grey RAL 7000
Measuring elements	copper-beryllium
Other internal components	aluminium, brass, galvanized and passivated steel

Double indicator for x and w

Indication range	0 to 100, others available
Scale	replaceable
Graduation	linear / root, other scaling available
Error limit	< 1 %

Indicator for output signal

Indication range	0 to 1.2 bar / 18 psi / 120 kPa
Graduation	0 to 1.2 bar / 18 psi / 120 kPa
Error limit	< 1.6 %

Signal generators for set point and output signal

Output adjustable	0 to 1.2 bar / 18 psi / 120 kPa
Supply air dependency	≤ 0.25 %/0.1 bar
Air consumption	≤ 100 l/h per signal generator
Load effect	
(measured at 0.6 bar)	+3 % for 70 l/h exhausted flow -3 % for 200 l/h delivered flow
Max. air output	± 1600 l/h

Manual-Auto switch

Type	push-buttons
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Controller section

System	cross-bellows
Control modes	P, PD, PI, PID
Operating point	
P / PD controller	set pneumatically, either internally or externally
Proportional band X _p	5 to 400 % and higher
Gain K _p ⁴⁾	20 to 0.25 and lower
Reset time T _n	0.03 to 50 min
Derivative time T _v	0.03 to 20 min
Tracking error ²⁾	≤ 0.7 %
Alignment offset ²⁾	≤ 0.7 %
Supply air dependency ²⁾	≤ 0.2 %/0.1 bar
Temperature effect ²⁾	≤ 0.2 %/10 K
Sensitivity ²⁾	≤ 0.1 %
Startup relay	for bridging time function in "manual"
Tracking relay	for bumpless manual - auto transfer, even with deviation
Mode switching	
- PI switching	reset bellows loading input, internal or external
- P / PI switching	switching with external signal
External feedback	external pressure applied to feedback bellows R+

1) Performance obtained from measurements under standard reference conditions as per IEC 546

2) Measured at X_p = 100 % resp. with PI controller

3) Master version

4) "Gain" with trend relay

MODEL CODES (continued)

Indicating Range (Scale) for X and W							
0-100% Linear (h)							A
To Be Specified (Acc. Standard List) (h)							B
Without Indicator (k)							C
Signal Range							
0.2 - 1.0 bar						1	
3 - 15 psi						2	
20 - 100 kPa						3	
Indicating Range for Output Signal							
0 - 1.2 bar						1	
0 - 18 psi						2	
0 - 120 kPa						3	
Mounting							
Wall/Pipe, Pneumatic Connection 1/4-18 NPT							A
Wall/Pipe, Pneumatic Connection G 1/4							B
Panel, Pneumatic Connection 1/8-27 NPT							C
Options							
Minimum Limitation Of YA And R (For P-Controller YA Only)							-A
Minimum Limitation Of R (b)(e)							-B
Maximum Limitation Of YA And R (For P-Controller YA Only)							-C
Maximum Limitation Of R (b)(e)							-D
Minimum/Maximum Limitation Of YA And R (For P- Controller YA Only) (b)(f)							-E
KH For Pipe Mounting							-M
Plug For Test Jack (O.P. For P-, PD-Controller)							-S
Protection Class IP65 (for Mounting Types A, B)							-P
Tag No. Labeling With Inscription							-L
Certificates EN 10204-2.1 (DIN 50 049-2.1)							-1

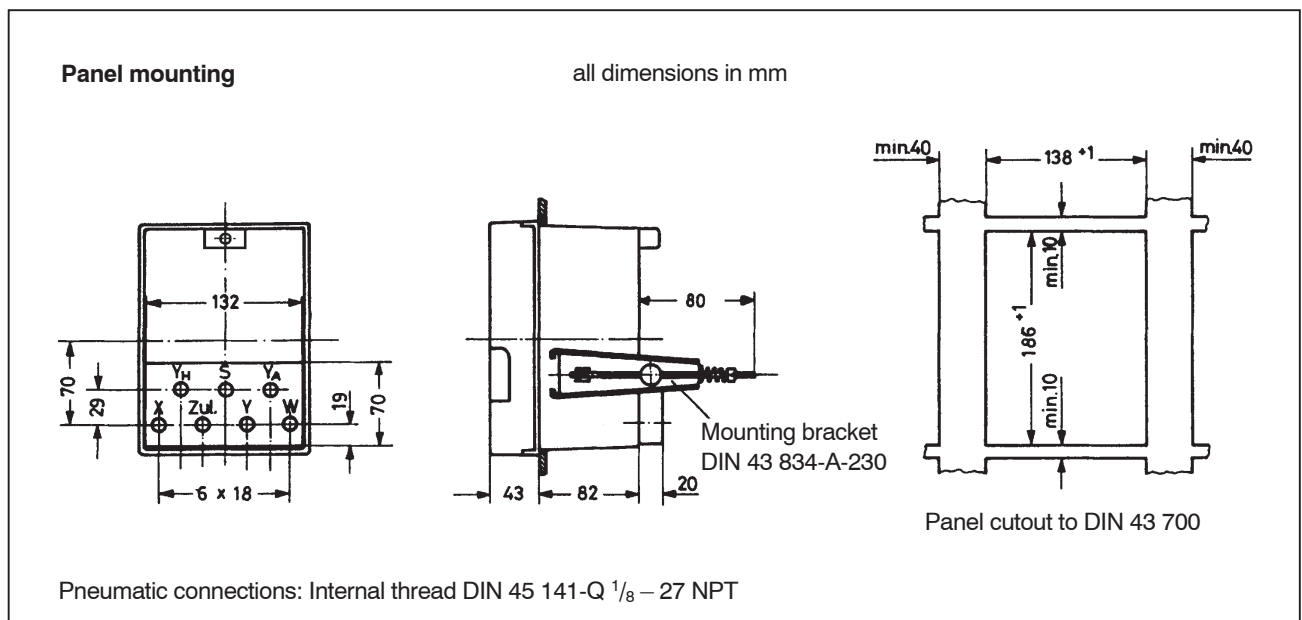
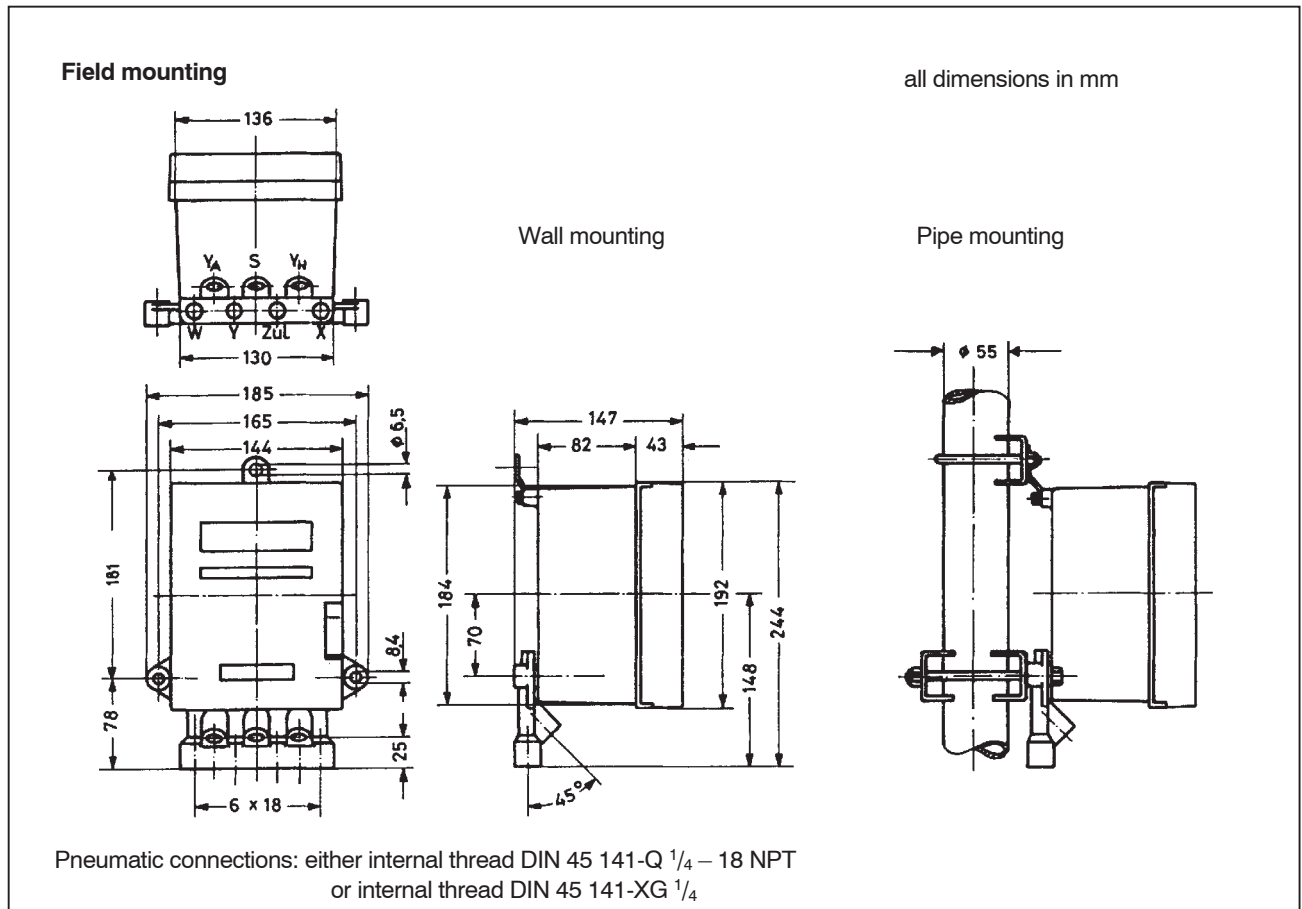
Example: P417 -1 42 A 2 1 C -AM

Tube fittings see EOO9001

Footnotes

- (a) Only available with Versions 1, 2, 3, 4
- (b) Only available with Versions 1, 2
- (d) Only available with Versions 1, 2, 5, 6
- (e) Only available with Control Modes 31, 32, 41, 42
- (f) Only available with Control Modes 31, 32, 34, 36
- (h) Not available with Version 6
- (k) Not available with Versions 1, 2, 3, 4, 5

DIMENSIONS

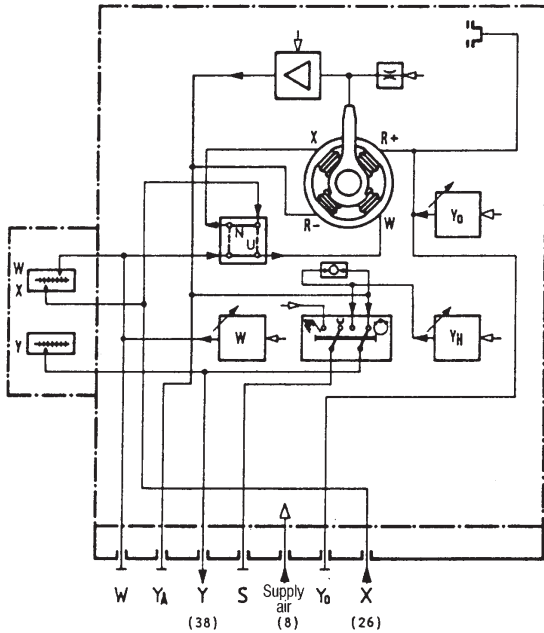


- Zul.** (8) = Supply air 1.4 bar / 20 psi / 140 kPa
- S** (77/78) = Switching signal
- YA** (39) = Controller output

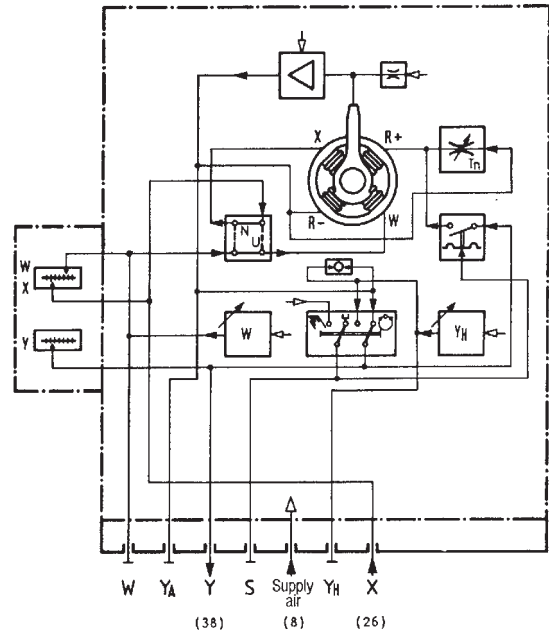
- Y (YH)** (38) = Output
- X** (26) = Measured value
- W** (27/37) = Set point

CIRCUIT EXAMPLES (internal)

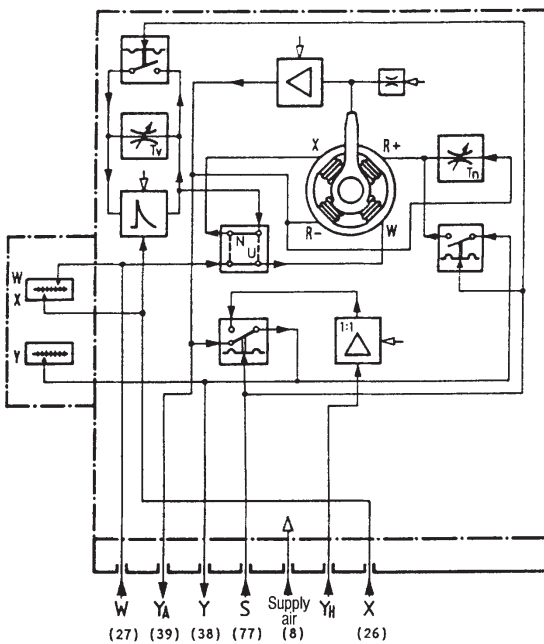
Code P417-111
P Controller with internal operating point



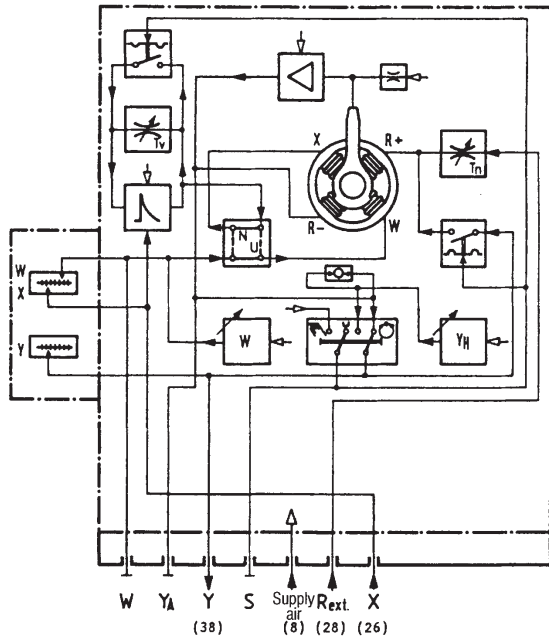
Code P417-131
PI Controller with T_n startup relay



Code P417-141
PID Controller with T_n and T_v startup relays

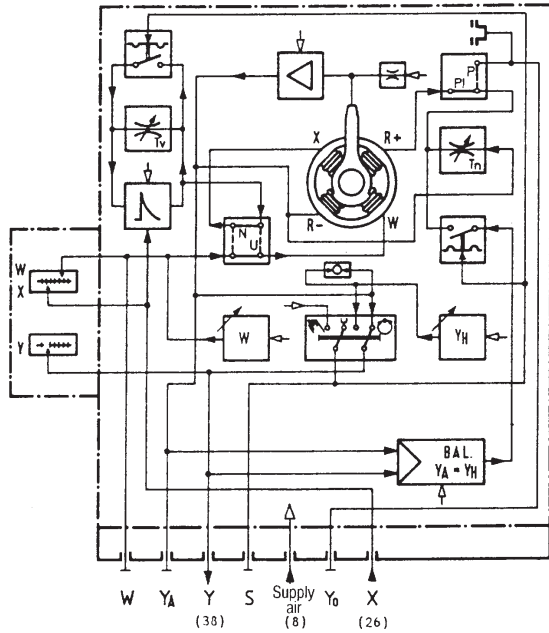


Code P417-147
PID controller with external feedback, T_n and T_v startup relays



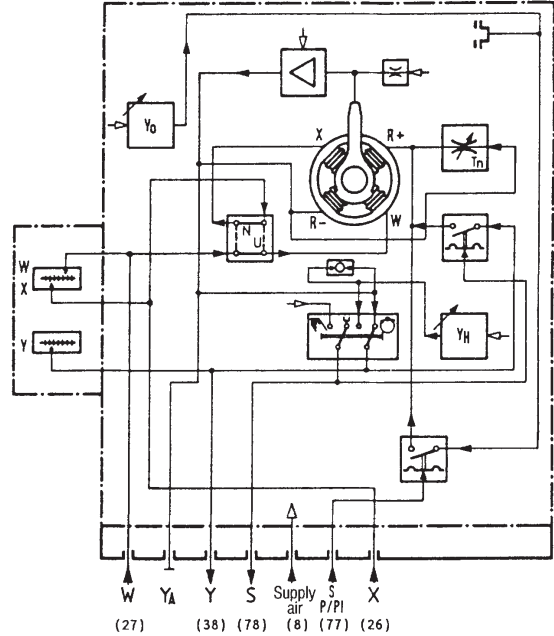
Code P417-164

P / PI / PID Controller with
 P / PI / PID switching, T_n and T_v startup relays
 and tracking relay, external operating point



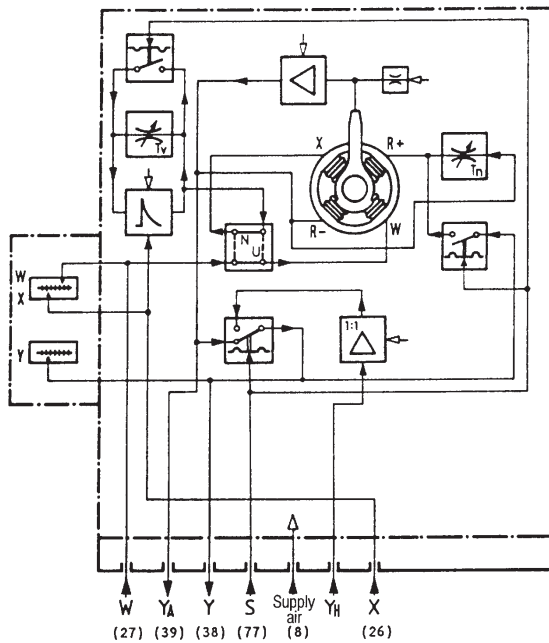
Code P417-255

P / PI Controller with
 P / PI remote switching and T_n startup relay,
 internal operating point



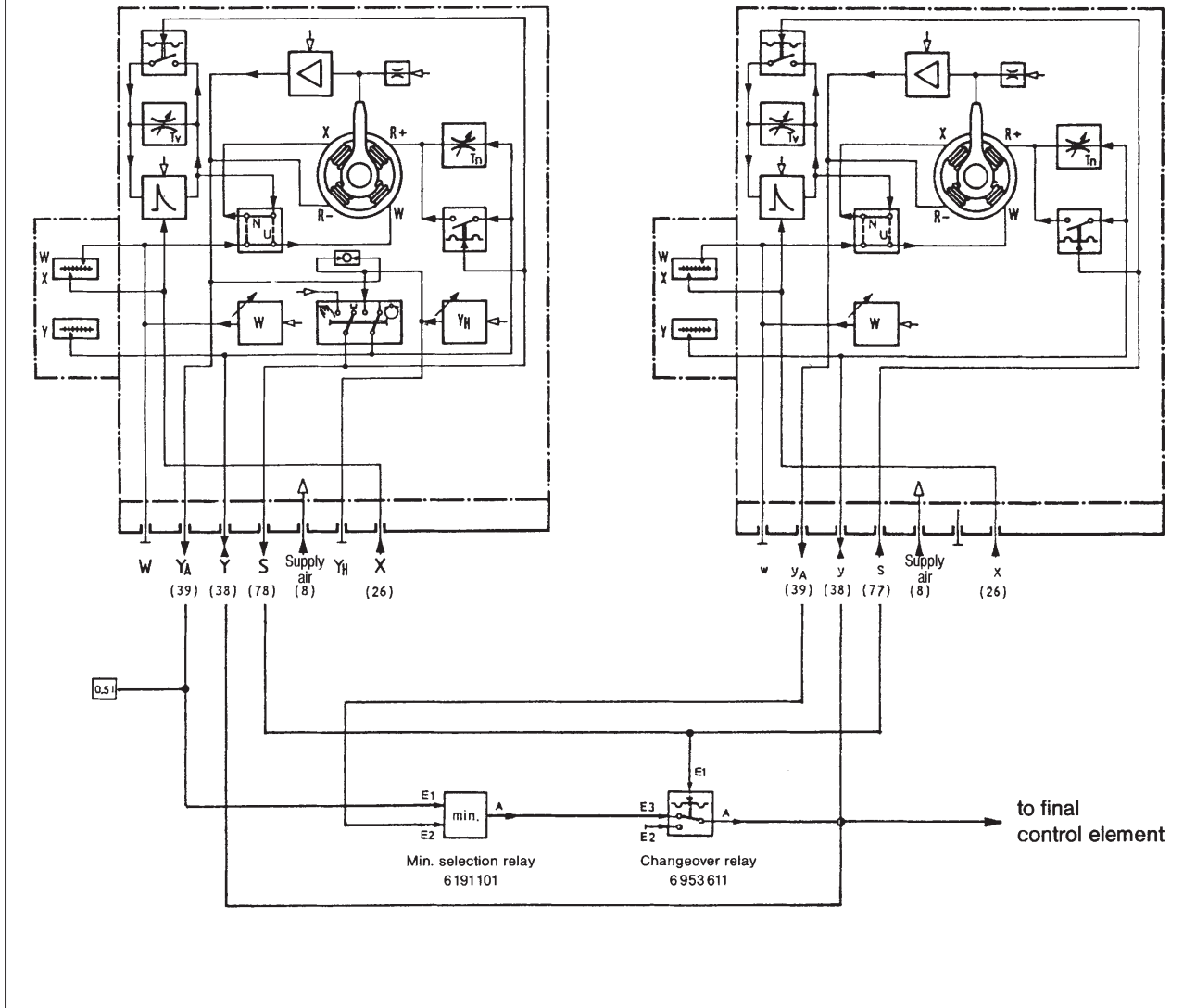
Code P417-541

PID field controller
 with indicator, T_n and T_v startup relays



Code P417-148
PID auto-selector master controller
 with T_n and T_v startup relays

Code P417-149
PID auto-selector slave controller
 with T_n and T_v startup relays



Numbers in parentheses = terminal identifications as per DIN 45 140 Part 1

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