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PEH-D Linear drive

Why develops Pruss an own electro hydraulic drive?

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- Pruss stopped the production of its own electro hydraulic actuator developed in the 50th.
- No adequate replacement available.
- Competition needs far too long to develop proper solution.
- No available concept seems to be good enough to fulfill the requirements (too heavy, too big, too hot, too expensive…).

Electro hydraulic compact drive

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Electro-Hydrostatic Drive PEH-D

Controllable like an electric drive.

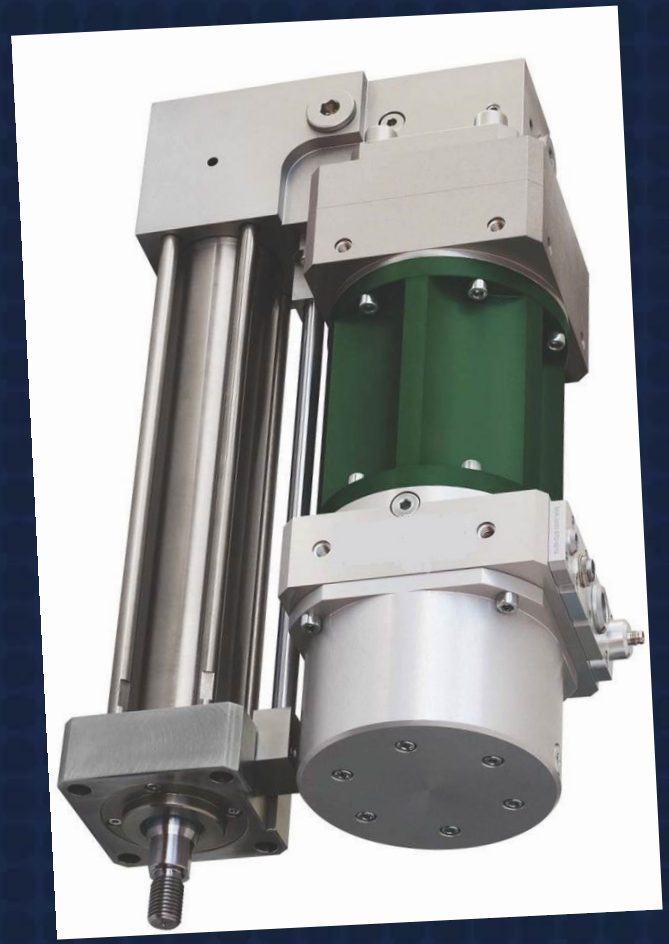
Powerful and precise like hydraulic actuators.

- Highest positioning accuracy (+/- 10µm).
- Controlled actuating speeds up to 96 mm/s.
- Fail safe speeds depending on size and stroke down to 0,1 sec.
- Fail safe function open /close optional available. Standard lock in place.
- SIL 2 approved (SIL3 in redundant setup)
- 1oo1 oder 2oo3 fail safe construction
- Forces: 10-180kN
- Speed examples:

  65 mm stroke; 18 kN; 40 mm/sec. controlled; 0,17 s Fail Safe close.

  35 mm stroke; 6 kN; 96mm/sec. controlled; 0,1 s Fail Safe close.

- **Complete capsuled System**
  without rotational Gaskets
- **Positioning independent installable.**
- **Precise positioning in connection with precise controllable force over the full stroke.**
- **Tear and wear- and maintenance-free**
  Lifetime oil filling
- **Independent fail safe spring**
  no modulating operation „against“ a spring. Therefore tremendously smaller cylinder, pumps and motors achievable. Based on that far lower weights and smaller dimensions as well as low temperature increase. With reached set point the motor stops and the cylinder will be hydraulically blocked in its position.
- **Optional air- / water-cooling available.**



Version without fail safe spring

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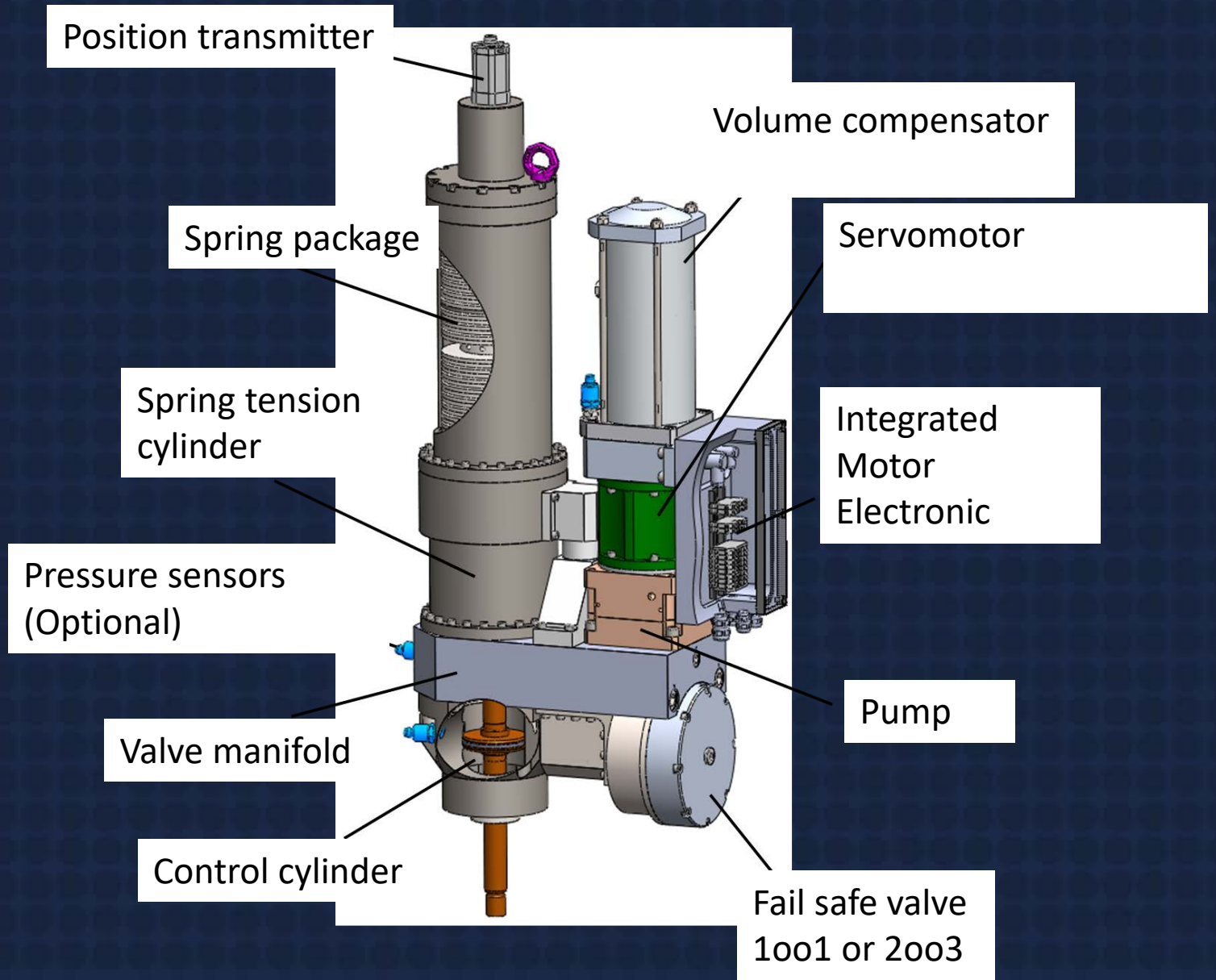
PEH-D incl. failsafe Function.		2.1	2.2	2.3	2.4	2.5	2.P1	2.P2
Pistondiameter	[mm]	90	90	160	160	160	80	120
Spindlediameter	[mm]	28	28	56	56	56	28	28
Pumpvolume	[l/min]	12,5	12,5	66	66	66	12,5	27,5
Controlspeed max:	[mm/s]	36	36	62,5	62,5	62,5	47,2	42,8
Area:	[mm^2]	5743	5743	17634	17634	17634	4409	10689
Strokevolume:	[cm^3]	373	373	2204	2204	2204	287	1336
Forces Net.Max.:	[kN]	35,1	44	83,8	102,8	141,5	26,5	64,2
Operational pressure max.	[bar]	61	76,5	47,5	58,2	80,2	60	60
continuesly Forces	[kN]	11,5	26,7	50,6	63,7	89,8	15	33,9
Continuesly pressure:	[bar]	20	46,5	28,7	36,1	50,9	34	31,7
Motor Power:	[kW]	2,8	3,5	6	6	7,6	2,1	3,5
Theoretical continuesly power:	[kW]	0,6	1,5	3,9	4,8	6,9	1,1	2,2
Length Springpackage (relaxed):	[mm]	448	461,2	712	814	861,6	448	764
Springplate-Outer diam:	[mm]	125	125	250	250	250	125	125
Springpackage relaxed:	[kN]	14,7	24,3	46,2	54,88	73,39	18,03	19,24
Springpackage compressed:	[kN]	18,6	32	52	71	95,2	27,88	29,57


Position transmitter
Volume compensator
Spring package
Servomotor
Spring tension cylinder
Integrated Motor Electronic
Pressure sensors (Optional)
Pump
Valve manifold
Control cylinder
Fail safe valve 1oo1 or 2oo3

PEH-D schematic P&ID failsafe close

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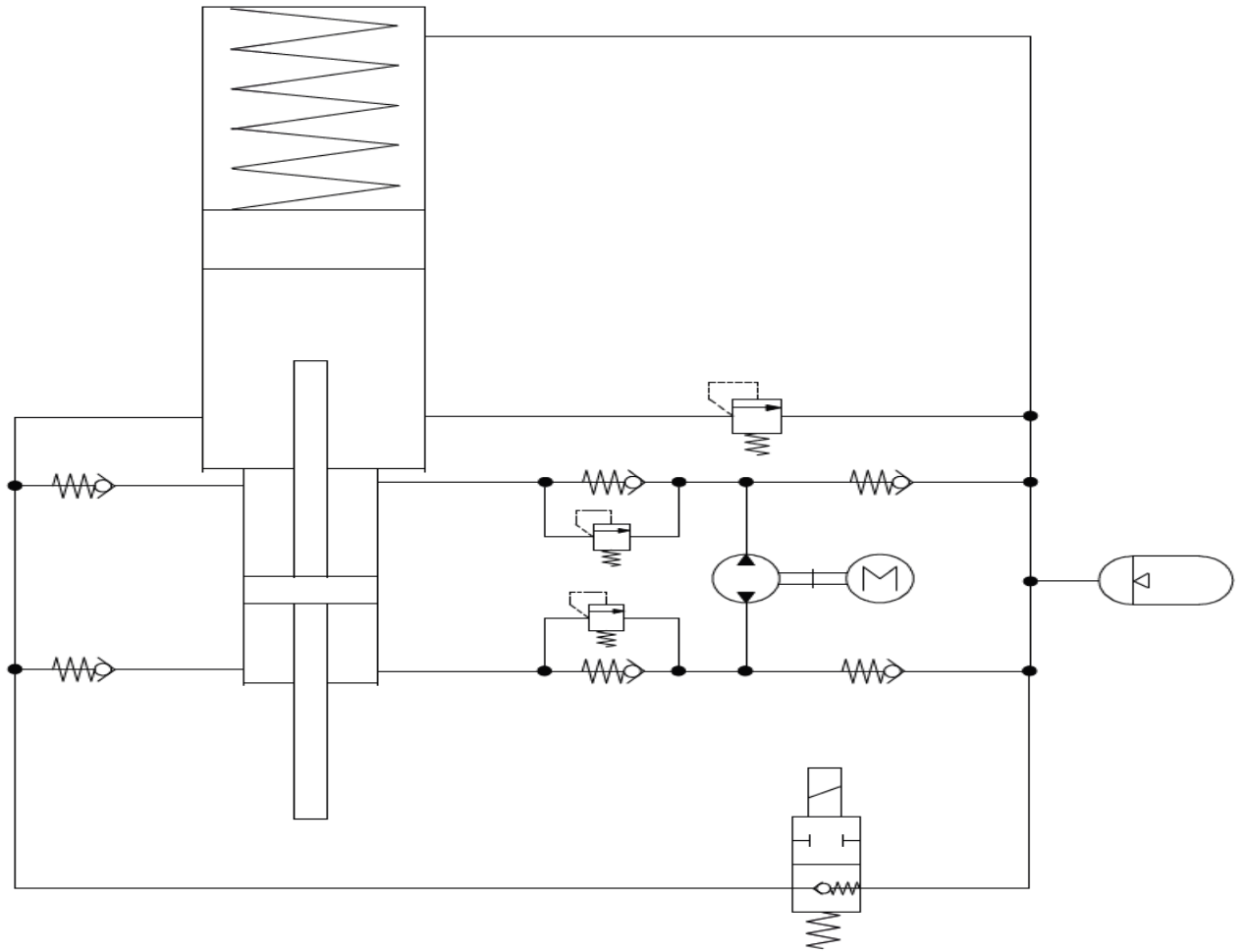
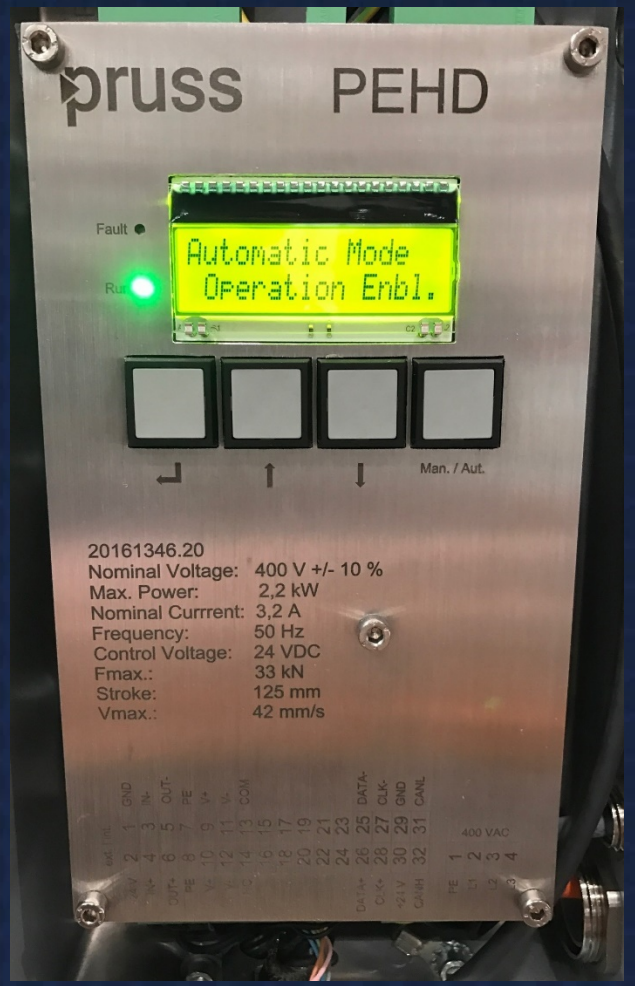
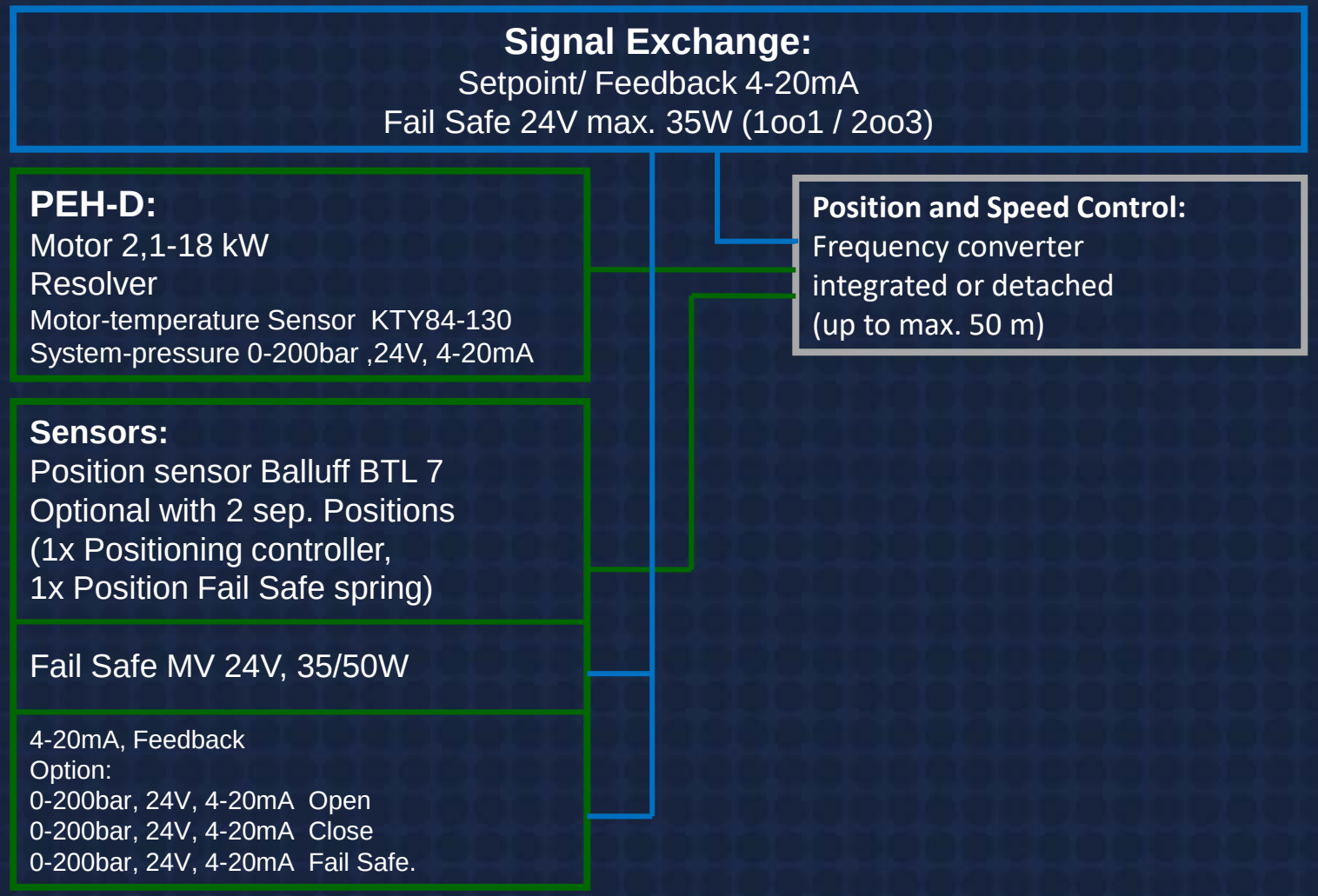
Schema



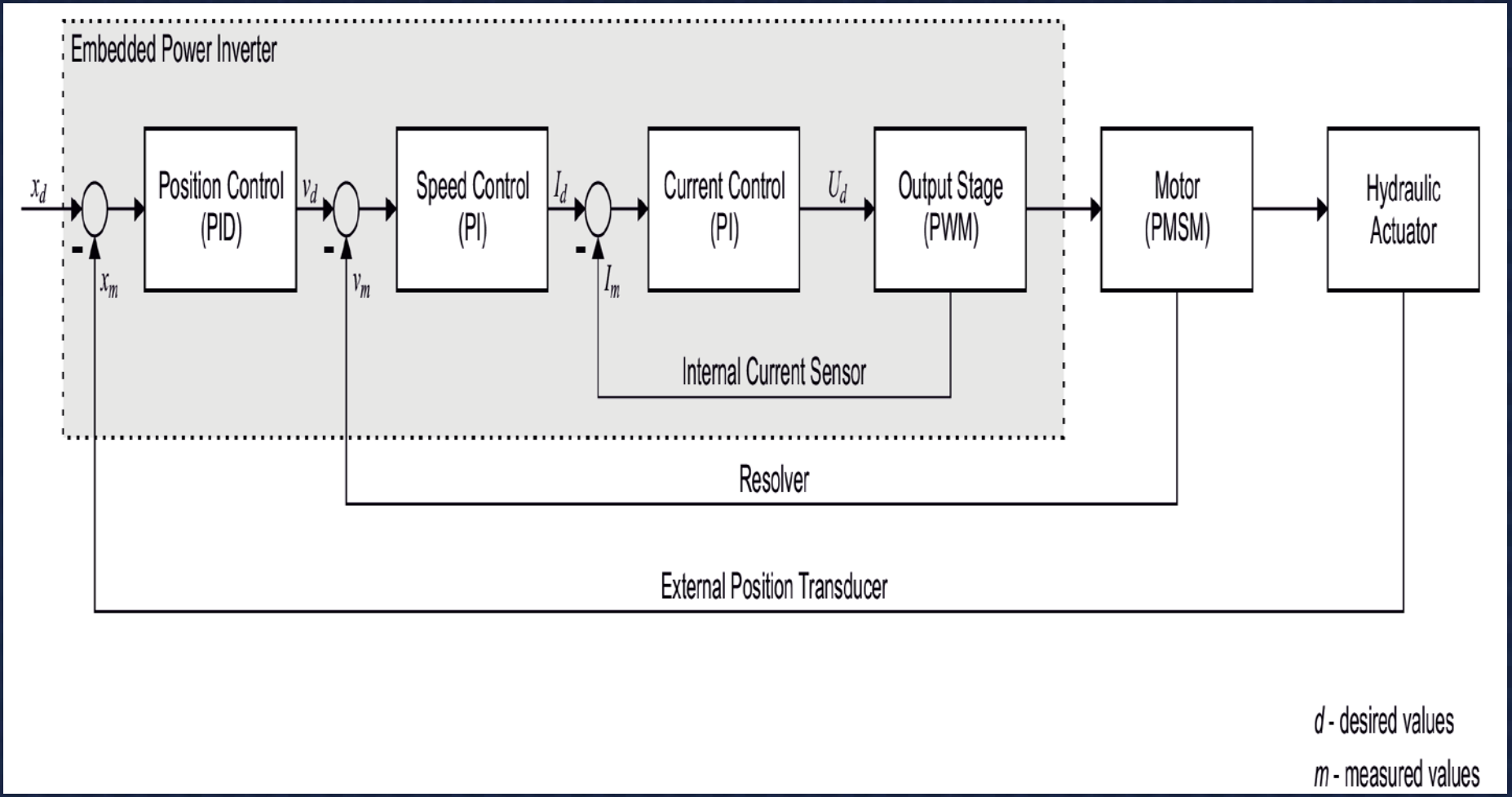
- Setpoint 4-20 mA
- Feedback 4-20mA
- Power Supply 230-690 VAC 50/60 Hz
- Fail Safe function 24 VDC (1oo1 or 2oo3)
- Force-feedback as option available
  (Pressure transmitter 4-20mA)
- Position and Speed-controller integrated.
  (optional up to 50 m detached available)
- Simple 4-Button Commissioning
- 2. set up level via CAN Open Bus available.
- Optional explosion proof available
  - -IEC Zone 2 IIA, T3-T6
  - -NEC 500 Class 1, Division 2, Class I Gas Group D, T3-T6
  - -NFPA70, NFPA497 Class 1, Division 2, Class I Gas Group D,T3-T6



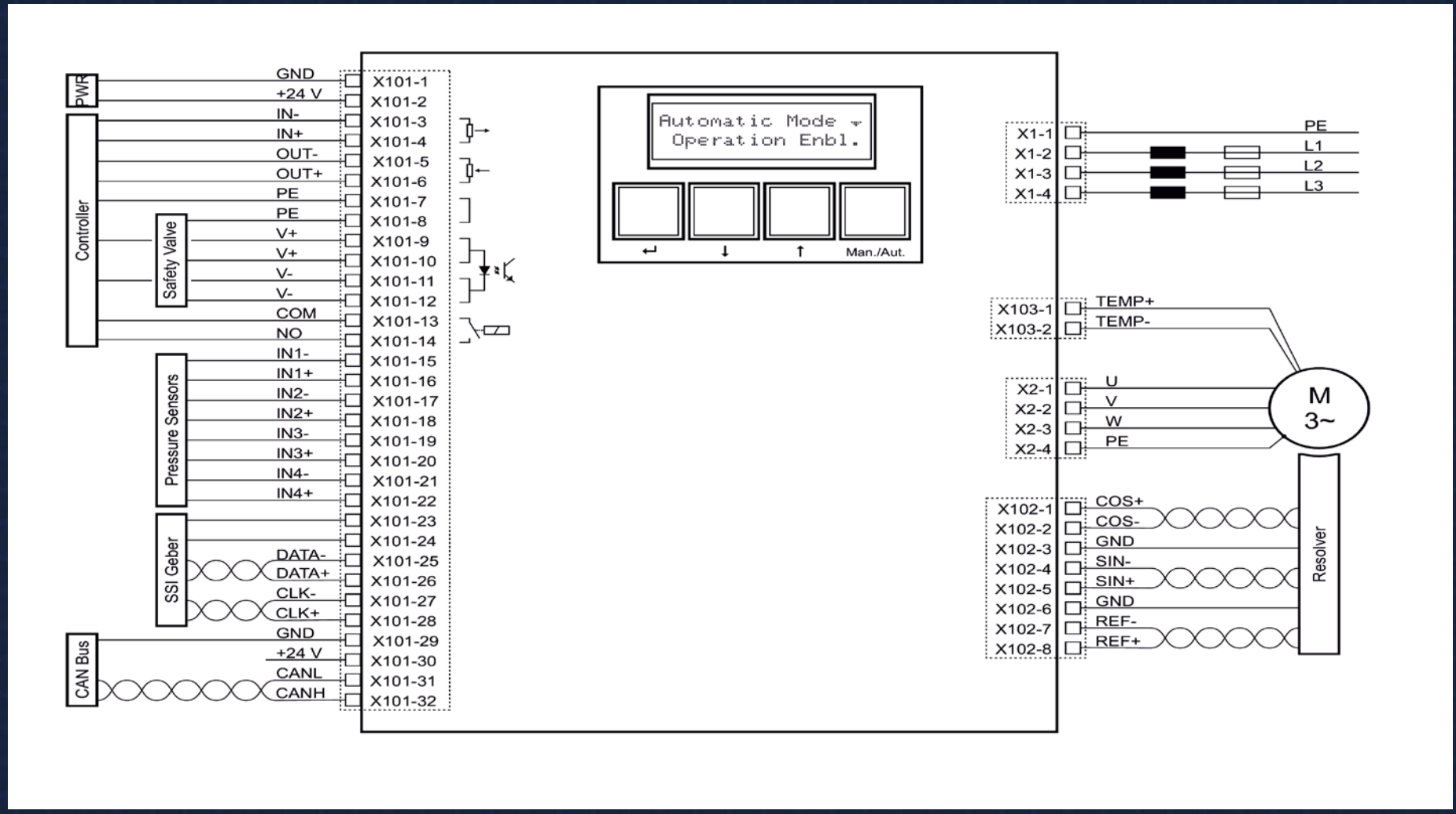
PEH-D controller



PEH-D control concept

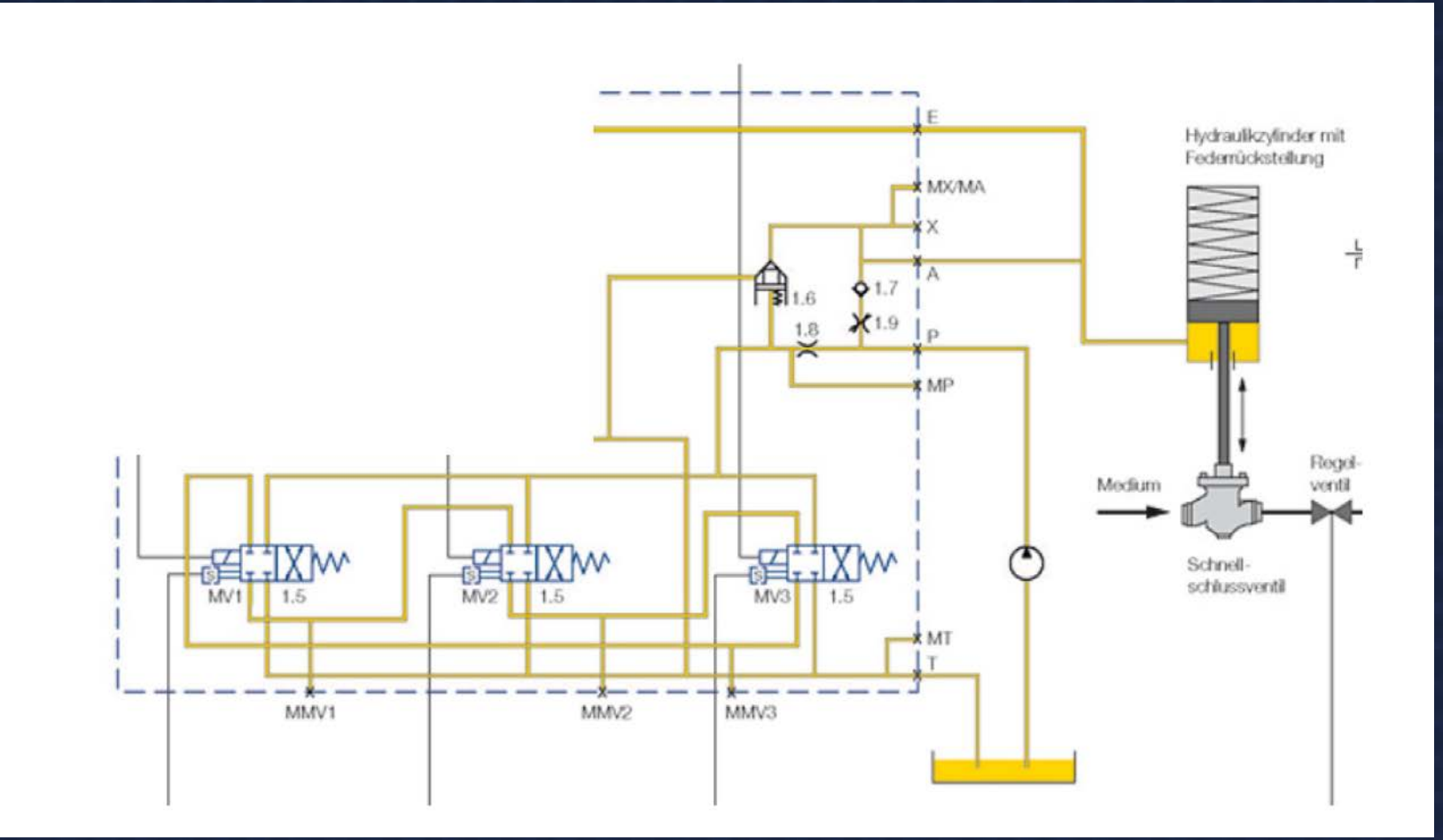


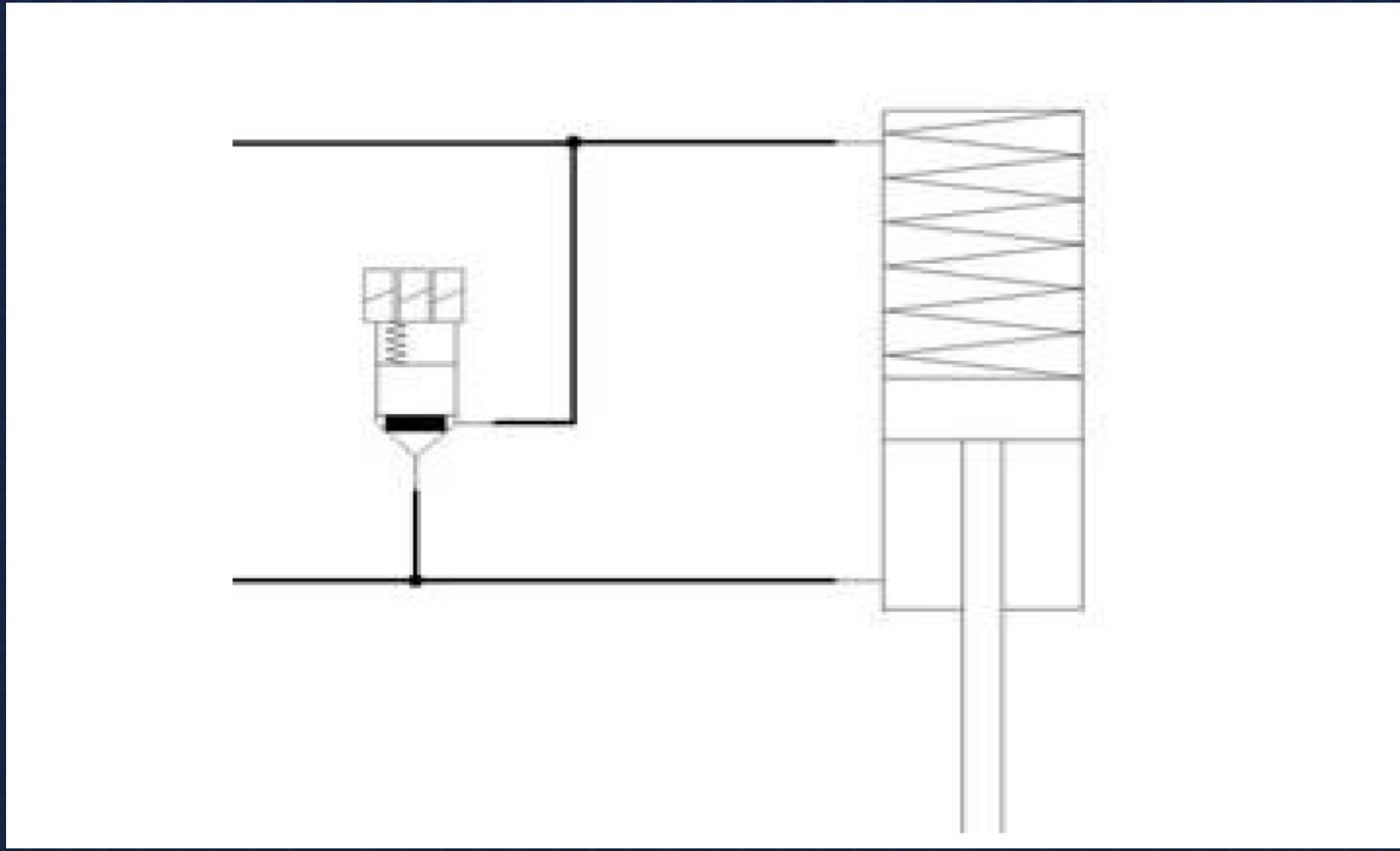
PEH-D wiring diagramm (3 phase version)

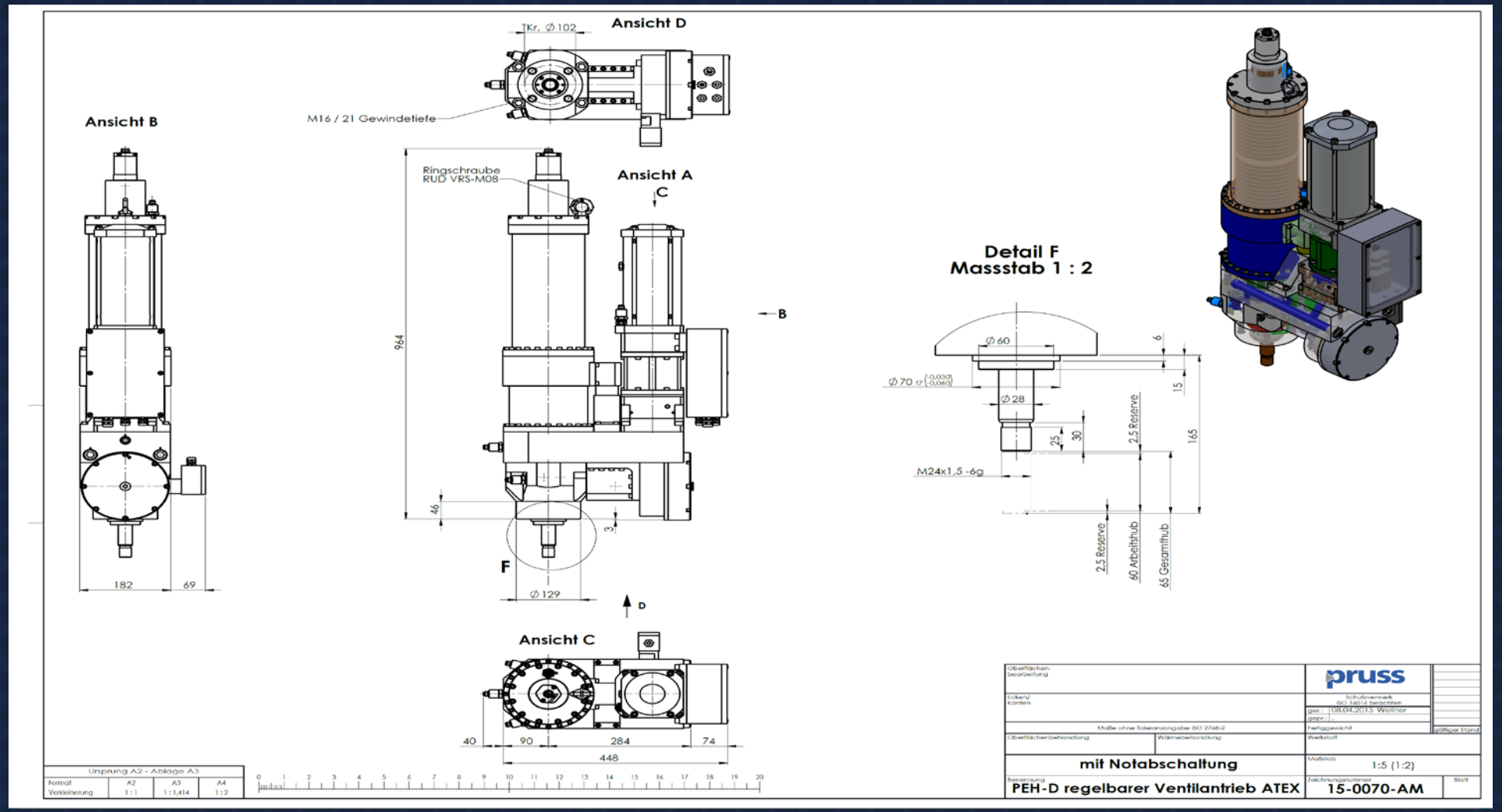


- After extensive research and constructive considerations, we are convinced that a much better, more reliable and cost-effective solution can be implemented instead of a classic "2 out of 3 circuit".
- In combination with the PEHD a classical 2oo3 circuit will be far too expensive.
- We see a solution in choosing our much better and even safer technique:
- The basic idea of our solution is:
  In the previous 2 out of 3 circuit, a cartridge is held hydraulically and the hydraulic release is realized by means of 3 solenoid valves.
  In our variation, there is also a safety valve, but directly controlled. This is held by 3 electric coils.
  The previous, additional hydraulic implementation is no longer necessary and thus possible sources of error are eliminated.
  Two coils can safely hold the valve closed, a coil certainly not. SIL 3 is fulfilled (test is about to start)

classical „mechanical“ 2oo3 fail safe function






Ansicht D
TKr. ∅102
M16 / 21 Gewindetiefe
Ansicht B
Ringschraube
RUD VRS-M08
Ansicht A
C
B
964
46
3
F
∅129
D
182
69
Ansicht C
40
90
284
74
448
Detail F
Massstab 1 : 2
∅60
6
∅70 f7 (-0,030 -0,060)
15
∅28
25
30
2,5 Reserve
165
M24x1,5 -6g
2,5 Reserve
60 Arbeitshub
65 Gesamthub
Ursprung A2 - Ablage A3
Format
Verkleinerung
A2
1:1
A3
1:1,414
A4
1:2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Oberflächen-bearbeitung
Kanten
Maße ohne Toleranzangabe ISO 2768-2
Oberflächenbehandlung
Wärmebehandlung
pruss
Schutzvermerk
ISO 16016 beachten
gez.: 08.04.2015 Wellner
gepr.:
Fertiggewicht
Gültiger Stand
Werkstoff
mit Notabschaltung
Maßstab
1:5 (1:2)
Benennung
PEH-D regelbarer Ventilantrieb ATEX
Zeichnungsnummer
15-0070-AM
Blatt

- Use of 2 complete units in combination used for Steam Shut off and Control valve with corresponding piping to use the units vise versa as backup.

- Combination of one unit without failsafe function,
  mounted on a Steam-turbine Inlet Control-valve
  and an ordinary failsafe cylinder on the Steam Turbine Trip Valve.