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Access			Keywords		Replace		Replaced by
<input type="checkbox"/> U Unclassified <input type="checkbox"/> H Internal (Unit) <input type="checkbox"/> F Confidential <input type="checkbox"/> SF Strictly confidential			EEx p Manual				
					Issued by		Package no.
							50217
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Supplier			Document title				
SIEMENS			TECHICAL MANUAL FOR EEx p SYSTEM				
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StatoilHydro				27			
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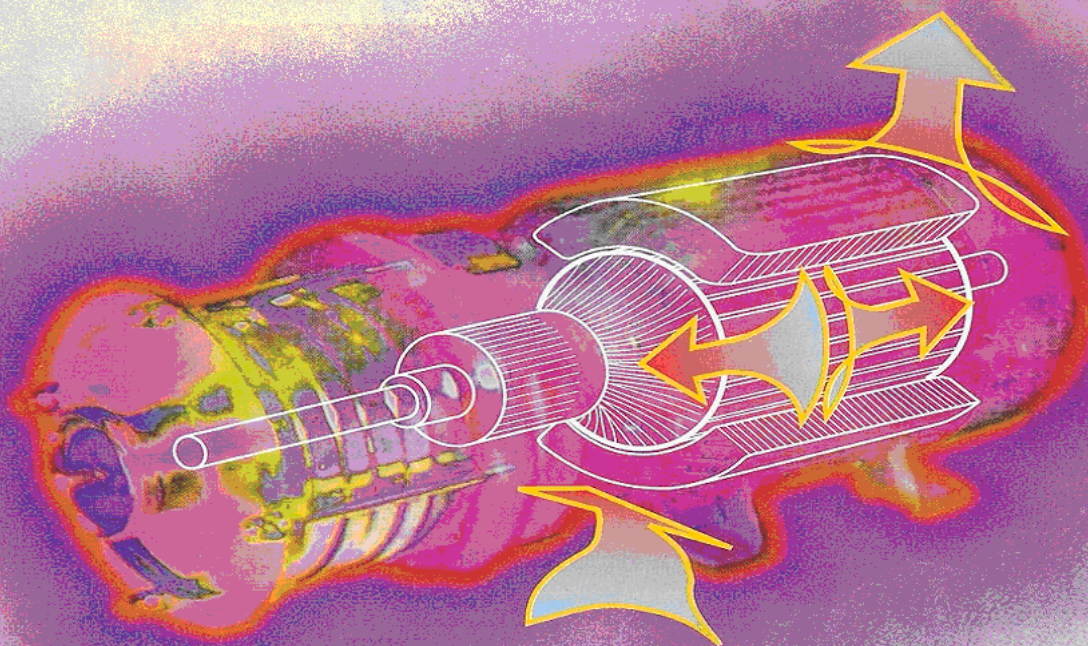
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title
TECHNICAL DOCUMENTATION EEx p SYSTEM F-361.C4

date of change 03.04.2006	revision Rev. 3.1	originator	format A4	file F-361c4se.doc
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EEx p system for motor operation in Ex-areas



Technical documentation

rev.	originator:	release: 3.0
originate (date / sign) 15.07.2003	checked: (date / sign) 07.04.2006 / QBS	release: (date / sign) Bachmann

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Description of EEx p system F-361.C4

The EEx p pressurization system F-361.C4 serves to create and maintain an overpressure in an EEx p motor enclosure to prevent the ingress of the ambient (potentially explosive) atmosphere, according to EN 60079-2 / EN 50016.

In addition a compensation for leakage losses is realized in a unique redundancy combination with a mechanical and an electronic controlled proportional valve.

Motors with kind of Ex-protection EEx p can operate in combination with the EEx p system F-361.F4 in Ex areas 1 and 2 (according to DIN EN 60079-14).

Combined with an enclosure which is suitable for use with overpressure the Ex protection class **EEx p IIC T4** according to EN 60079-2 / EN 50016 can be obtained. Standard ambient temperature for operation is -20 °C up to +55°C. Other temperature ranges are available on request.

Before commissioning please take note of the following points:

1. Clean the connected air pipe or tubing system of the installation plant to ensure that the supplied air tube is free of dirt or small parts which will cause a malfunction of the purging system, if no air filter is used.
2. The internal volume of the motor enclosure must be purged with non-explosive compressed air, to reduce a possible explosive gas concentration to safety limits.
3. After purging the motor enclosure, an overpressure must be maintained inside the motor to prevent ambient air, which can contain explosive gas.

The overpressure inside the motor enclosure is continuously monitored.

If the pressure drops under the reference value an alarm signal is given and the motor has to be switched off automatically.

The EEx p System F-361.C4 comprises the following components:

- **control cabinet ST-200F/ST-200FM**

consists of: main air valve for pressure supply, purge valve, proportional valve for operating pressure (leakage compensation), adjustment valves for purge- and leakage volume, measure points (to acquire leakage volume and the pressure inside the motor enclosure), indicator for purge pressure, EEx d junction box F900.041, EEx d box F-900.001, main switch, control unit F-351 (connected with terminals in junction box) for the signals "**ready to start**", "**motor not purged**", "**purging in progress**", "**purge sequence finished**" and „**motor shutdown**“.

The control cabinet ST-200C/200CM monitors the air flow of the outlet valve and the pressure inside the motor enclosure. Simultaneous the control automatic works in accordance with EN 60079-2 / EN 50016 and ATEX 94/9.

This monitoring system is a highly secure and redundancy controlling unit certified according to **EN954-1** (security class Cat. 3).

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- **Outlet valve VA-100-3H**

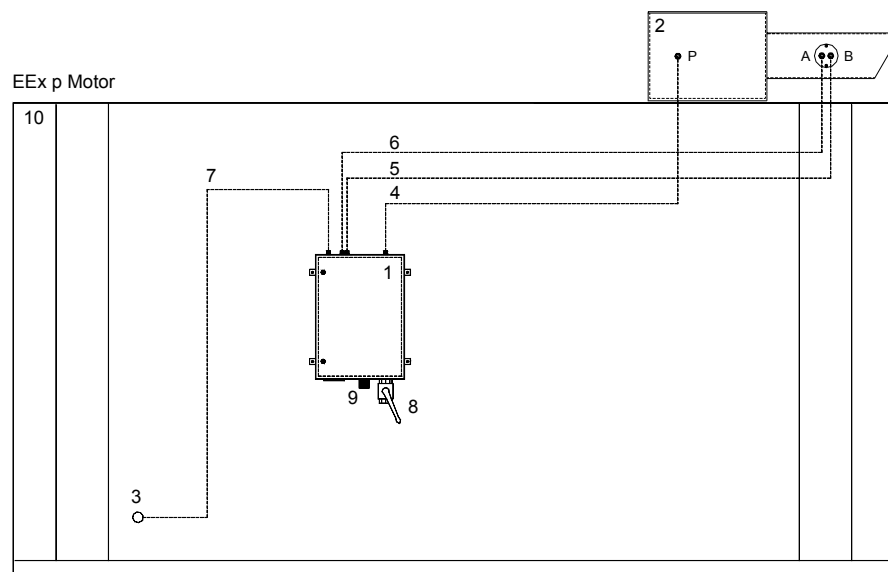
The outlet facility consists of a heavy duty case with built in pneumatic controlled valve and integrated spark arrestor and particle barrier.

The outlet valve opens during the purging sequence to ensure the purging of the motor enclosure according to EN60079-2/EN50016 .The outlet valve itself can be mounted in any position. The valve closes completely if the purging sequence is finished.

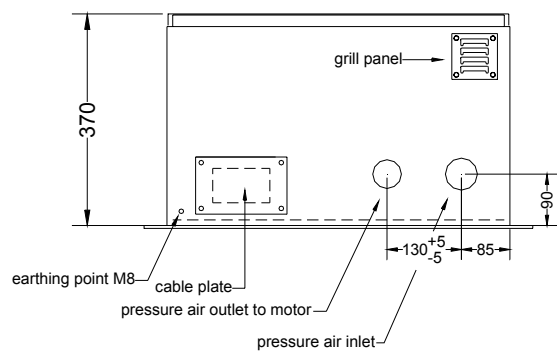
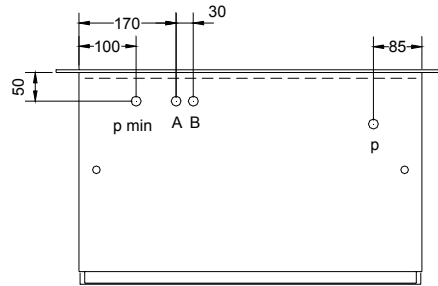
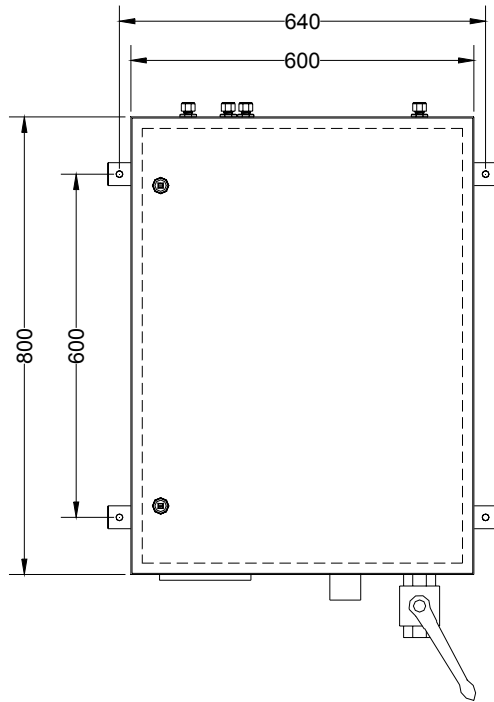
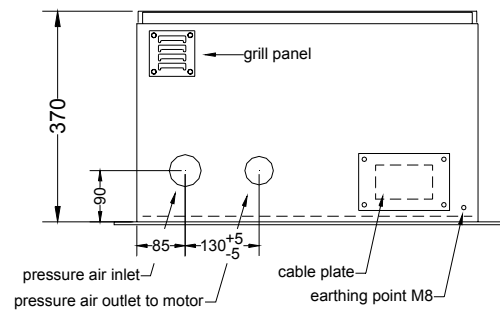
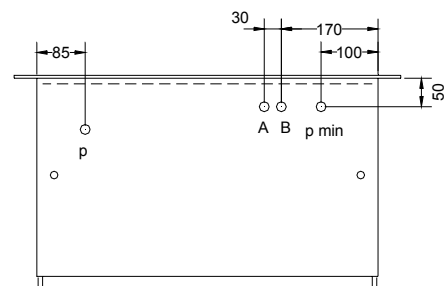
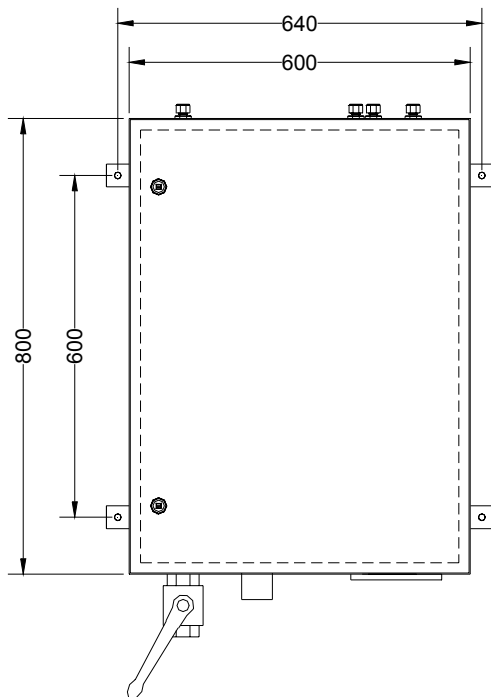
- **Test certificate**

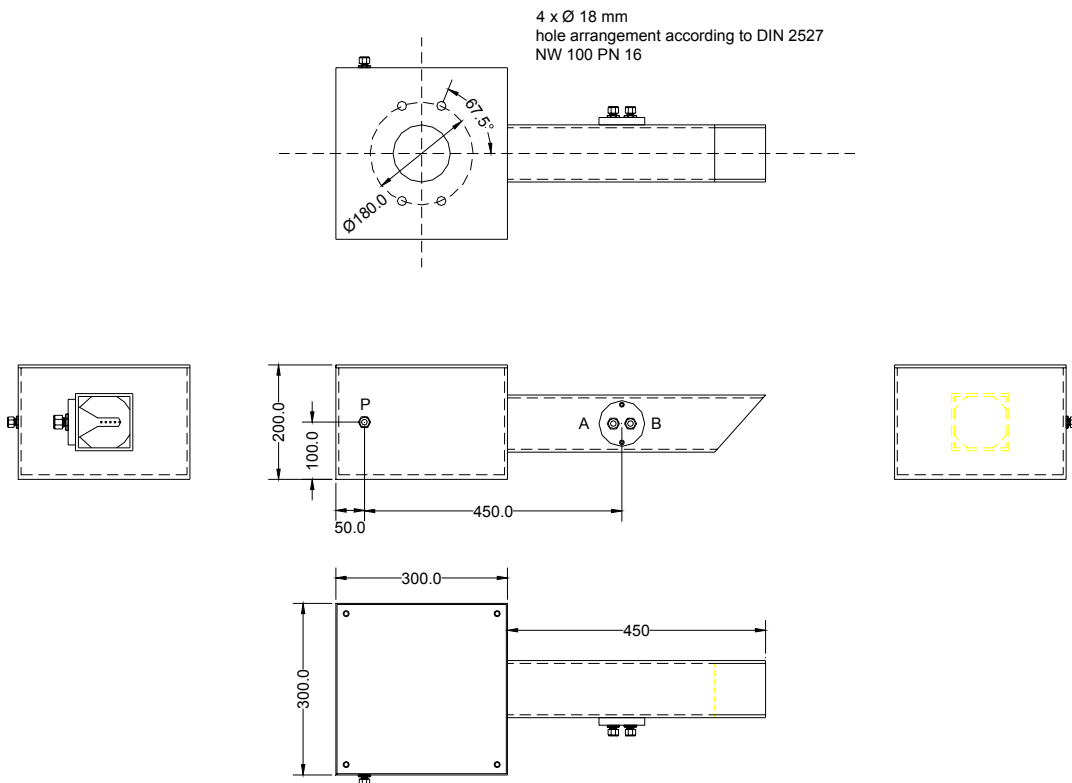
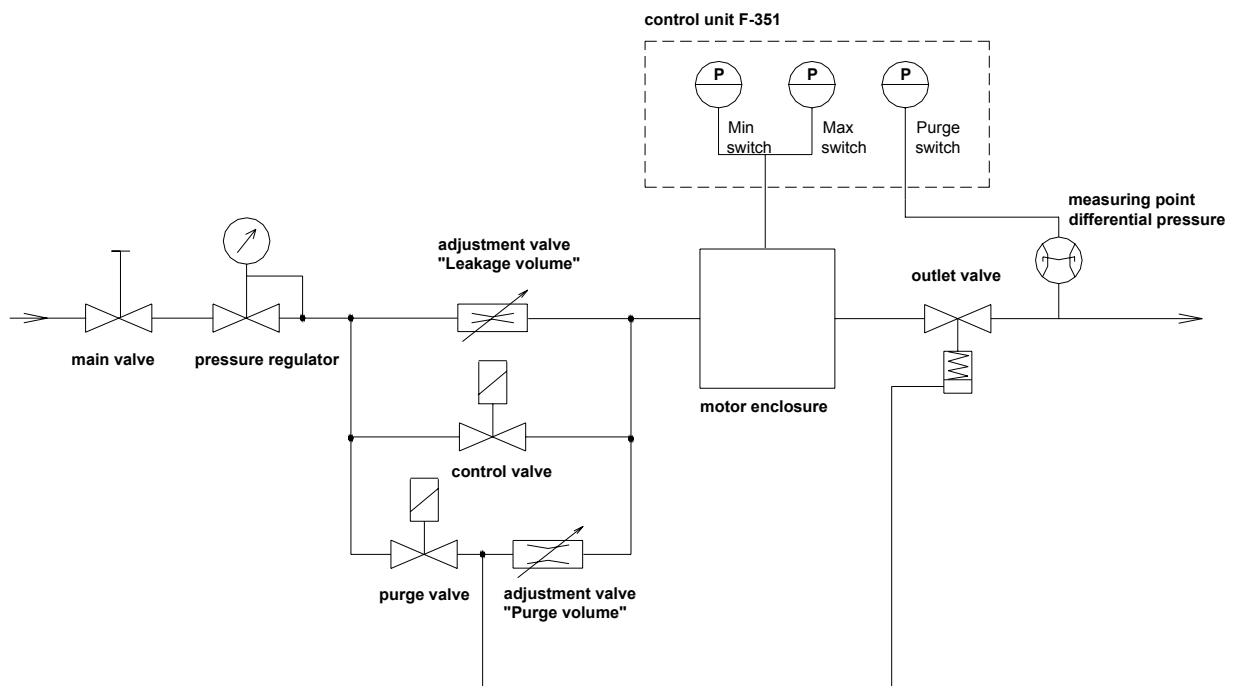
The motor system is provided with a test certificate as shown in the annexure of this documentation.

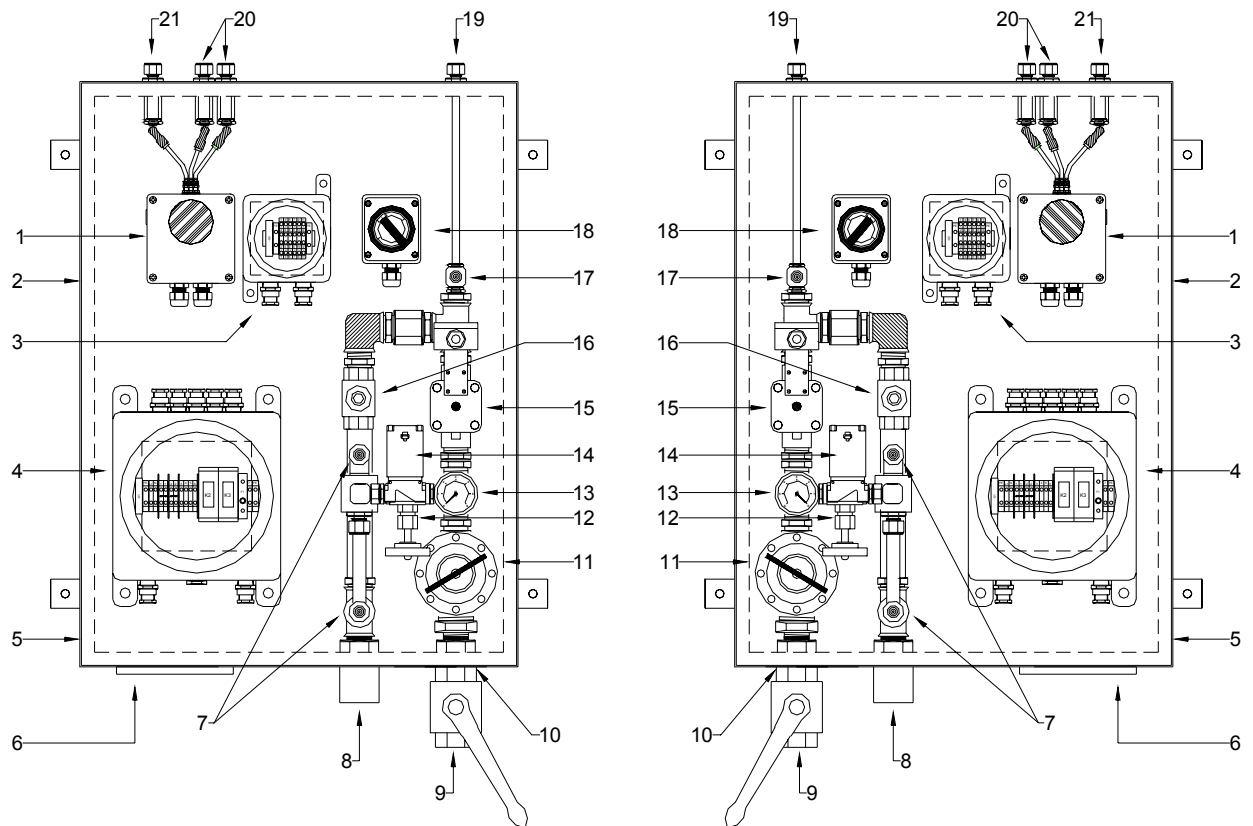
Mounting example



- 1: control cabinet ST-200C/CM
- 2: outlet valve VA-100-3H
- 3: measure point motor inside pressure
- 4: pilot line to outlet valve
- 5 and 6: measure points air volume
- 7: measure line motor inside pressure
- 8: compressed air connector for supply
- 9: compressed air connector to motor
- 10: motor enclosure

Änd./
Mod.**Dimensions of ST-200C**If not written down the tolerance is ± 2 mm.**Dimensions of ST-200CM**If not written down the tolerance is ± 2 mm.

Änd./
Mod.**Outlet valve VA-100-3H**If not written down the tolerance is ± 2 mm.**P&I diagram**

Änd./
Mod.**Internal view control cabinet ST-200C / ST-200CM**

- 1: control unit F-351
- 2: control cabinet
- 3: EEx d enclosure F-900.001
- 4: EEx d enclosure F-900.041
- 5: name plate
- 6: cable plate
- 7: test conn. „diff. pressure“
- 8: air outlet to motor
- 9: main air valve
- 10: grill panel
- 11: pressure reducer

- 12: adjustment valve „leakage comp.“
- 13: pressure gauge
- 14: proportional valve
- 15: purge valve
- 16: adjustment valve „purge volume“
- 17: test conn. „pilot pressure outlet valve“
- 18: main switch
- 19: conn. „pilot pressure outlet valve“
- 20: conn. „diff.pressure“
- 21: conn. „motor inside pressure“

Änd./
Mod.**Technical data****1: Control unit F-351**

Ex-protection class:	II 2 G EEx e m ia [p] IIC T4
Protection class:	IP 65
Temperature range:	-30°C ... +60°C
Certified by:	TÜV02 ATEX 1801
Security class:	AK4, acc. to EN 954-1, cat. 3
Min flow volume:	0,1 – 99 NI/s (setting: 10 NI/s)
Pressure switch „Min“:	0,8 – 25 mbar (setting 0,8 mbar)
Pressure switch „Max“:	10 - 25 mbar (setting 15,0 mbar)

2: Control cabinet

Type:	ST-200C/CM
Material:	sheet steel, 2 mm
Colour:	RAL 7032
Protection class:	IP 23 (IP 55 on request)

(Other materials or colours on request !)

3: Control- and junction box F-900.001

Ex-protection class:	II 2 GD EEx d IIC T6
Protection class:	IP 66
Temperature range:	-20°C ... +55°C
Certified by:	CESI 01 ATEX 036
Bore holes:	½" NPT

EEx d cable glands

Type:	FL 1
Diameter:	I1B (ELB), I1B for client
Ex-protection class:	EEx d IIC
Protection class:	IP 66
Temperature range:	-20°C ... +80°C
Certified by:	CESI 00 ATEX 052

4: Control- and junction box F-900.041

Ex-protection class:	II 2 GD EEx d IIC T6
Protection class:	IP 66
Temperature range:	-20°C ... +55°C
Certified by:	CESI 01 ATEX 036
Bore holes:	½" NPT

EEx d cable glands

Type:	FL 1
Diameter:	F1B (ELB), I1B for client
Ex-protection class:	EEx d IIC
Protection class:	IP 66
Temperature range:	-20°C ... +80°C
Certified by:	CESI 00 ATEX 052

5: name plate

Identification of the system

Änd./
Mod.

6: Cable plate	
W x H x D:	160 x 120 x 10 mm
Cut out in cabinet:	80 x 60 mm
7: Test connector	
Differential pressure (Dim. for air volume)	
Connector:	quick disconnect coupling DN 5
8: Air connector to motor:	Rp 1", inside screwed flanges on inquiry
9: main air valve:	Rp1 ½", inside screwed flanges on inquiry
10: Grill panel	for air compensation
11: Pressure regulator	
Inlet pressure:	max. 25 bar
Outlet pressure:	0 – 6 bar
12: Adjustment valve „Leakage volume“	
Adjustment range with prop.valve :	max. 90 Nm ³ /h, at 3 bar pre- pressure
13: Pressure gauge	
Indication range:	0 – 6 bar
14: Control valve „Operating pressure“	
Proportional valve (coil type 72):	T _{amb} up to + 40 °C
Proportional valve (coil type 73):	T _{amb} up to + 55 °C
Ex-protection class:	II 2 G EEx m II T4
Certified by:	PTB 00 ATEX 2202 X
Operating range:	variable Nm ³ /h
15: Purge valve	
Ex-protection class:	II 2 G EEx em II T4
Temperature range:	-30°C ... +60°C
Certified by:	PTB No. 00 ATEX 2129 X
Operating range:	max. 450 Nm ³ /h
16: Adjustment valve	
Purge volume	
Adjustment range if pre-pressure 3 bar:	0 – 450 Nm ³ /h
17: Test connector	
Pilot pressure outlet valve	
Connector:	quick disconnect coupling DN 5
Pilot pressure:	ca. 1 bar

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Mod.**18: Main switch**

Ex-protection class: II 2 G EEx ed IIC T6
 Protection class: max. IP66
 Certified by: PTB 01 ATEX 1105
 Temperature range: -20°C ... +50°C

19: Connector

Pilot line outlet valve
 Connection: male adapter union , tube 10 mm

20: Connector

Differential pressure
 Connection: male adapter union , tube 10 mm

21: Connector

Motor inside pressure
 Connection: male adapter union , tube 10 mm

Electrical data

Power supply	Purge	Operate
230 VAC	150 mA	125 mA
115 VAC	300 mA	230 mA
24 VDC	1200 mA	750 mA

Temperature range F-361.C4

T_{amb}: -20°C ... +40°C, optional: -20°C ... +55°C, -40°C ... +40°C, -40°C ... +55°C

For an operation below temperatures of – 20°C down to -40°C an Ex-heater (400 W) is additional mounted in the enclosure.

Using the EEx p system with temperatures higher than + 40°C the proportional valve (Pos. 14) has to be interchanged with a proportional valve suitable for +60°C. The main switch (Pos. 18) has to be changed while the temperature is higher than + 50 °C.

Weight

Control cabinet ST-200C/CM: 88 kg
 Outlet valve VA-100-3H: 27 kg

Minimum requirements for air pressure

recommended pressure air volume: 450 m³/h / 3 bar
 particle size: 100 µm max
 water content: 90 % rel. humidity max
 medium temp. range: -10 °C ... + 40 °C

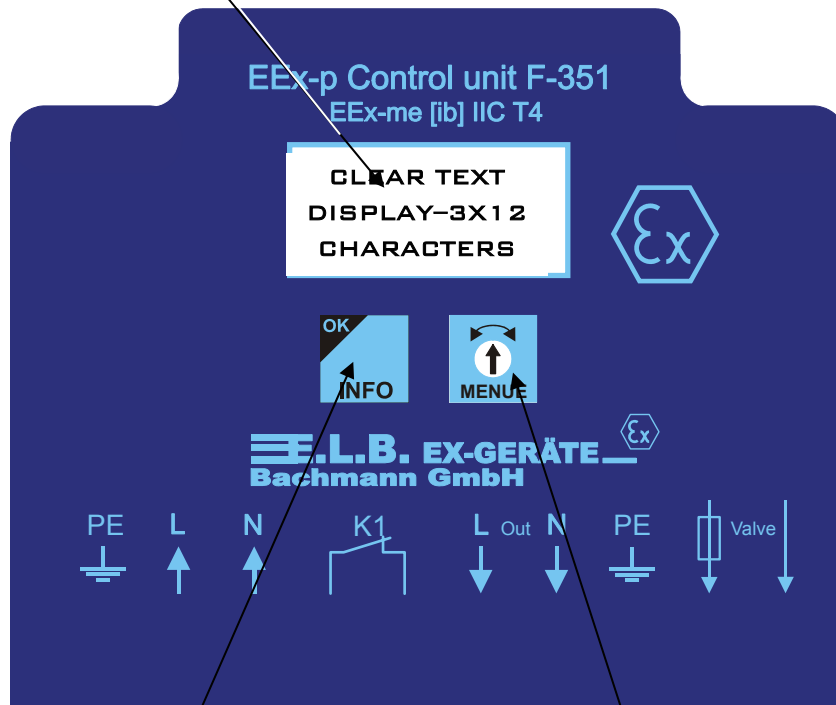
The maximum air flow can reach ca. 450 m³/h and produces during the purging sequence in the motor enclosure an overpressure of ca. 5 mbar. If the air quality is not guaranteed, special filters can be delivered on inquiry.

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Mod.

Basic functional description F-351

For a detailed description see manual F-350.

Clear text LC display
with choice of language.
3 lines with 12 characters each.



OK / INFO button

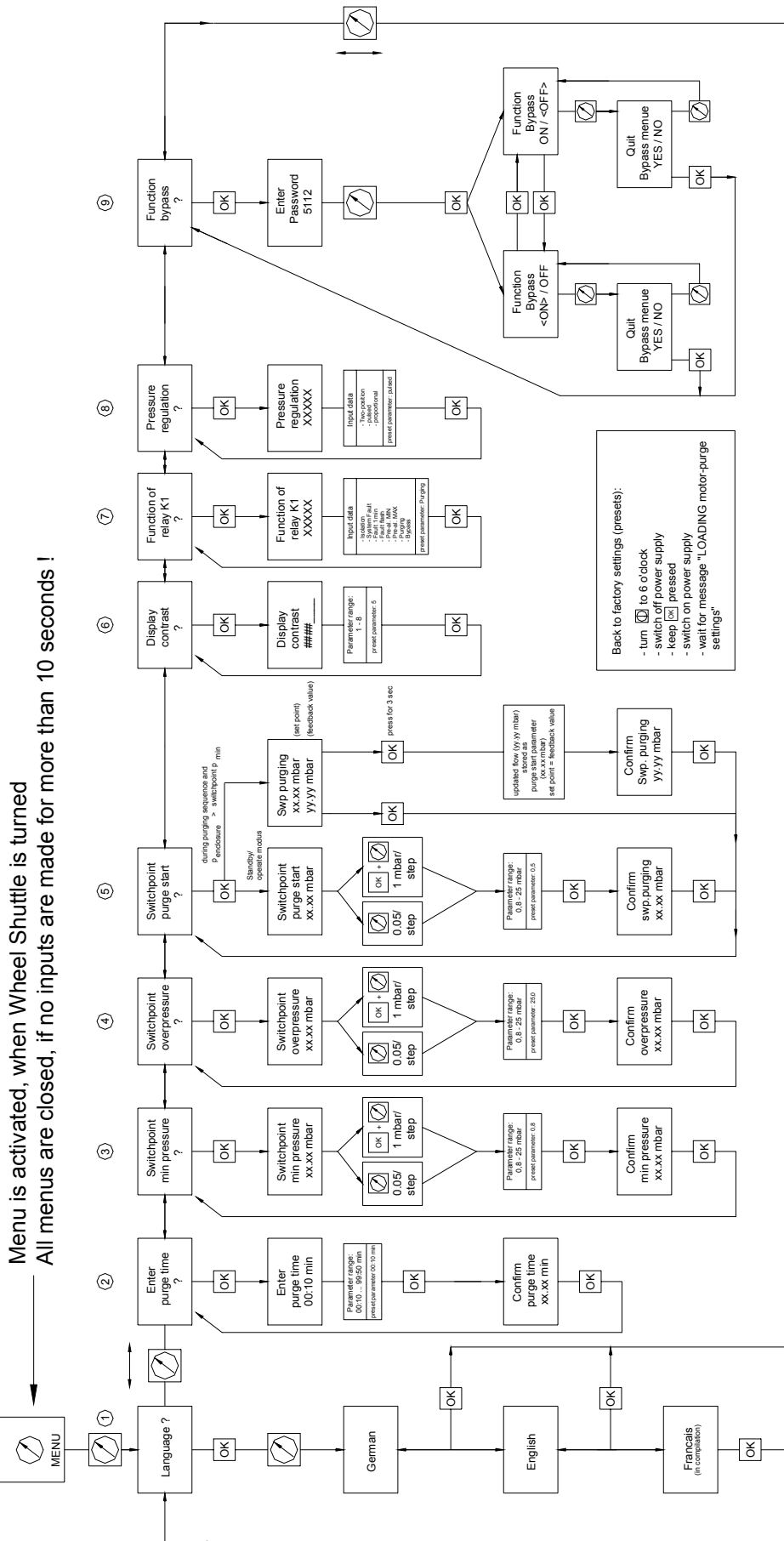
Switches the display over between measuring data and info menu.
Confirms selected parameters or values.

Wheel Shuttle®

Rotary switch, screwdriver-activated.
Switches over between different parametrizing menus, submenus or selectable data.

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Mod.

Menue



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Mod.

Structure and Function

In conjunction with an enclosure (motor enclosure, junction box), the EEx-p system F-361.C4 provides a pressurized motor that is in compliance with EN 60079-2 / EN 50016. For this purpose, it has all the facilities and sensors needed to monitor the necessary purging phase and then to monitor and maintain an overpressure within the EEx-p enclosure (motor cabinet).

1 Structure

The controlling system consists mainly of two components which must be installed separately:

- controlling cabinet ST-200C/CM, with built-in piping ,valves, electronic and
- the outlet valve VA-100-3H.

The controller F-351 itself monitors and regulates the overpressure in the enclosure, while the digital/proportional valves doses the air quantity needed to achieve the pressurized apparatus.

2 General Functional Description

After a functional test and start-up, the controller F-351 in the control cabinet ST-200C/CM monitors the flowrate of the compressed air or inert gas during the initial purging process, and then monitors and regulates the internal pressure of the EEx-p enclosure with regard to the surrounding atmosphere during normal operation.

Display

In three lines of 12 characters each, the digital display shows the enclosure's internal pressure during normal operation, and the remaining purging time in minutes and seconds during the initial purging process. During normal operation, you can call up further information by pressing the button "OK / Info". Faults which are detected during the self-check are shown here with a number.

OK-button

The button on the left side ("OK / INFO") is used in normal operation to call up the stored parameters "Enclosure Pressure", "Purging Time", "Function of Relay 3", "Function of Relay 4", "Switchpoint of Purge Start", "Switchpoint of Minimum Pressure", "Switchpoint of Overpressure" and "Regulation". During the parametrization, this button is used to select and confirm the various parameters.

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Mod.

Rotary switch

The right field ("Menu") permits access to the Wheel Shuttle[®] with a tool (e.g. a screwdriver) for parametrizing the controller. With this Wheel Shuttle, you can start the parametrization and set the individual parameter values.

Screw terminal

In the lower part of the cover (see page 1), the terminal assignment of the Controller is shown. Terminals 1 to 3 are inputs; they provide electrical power to the Controller. Terminals 4 to 19 are outputs, over which the monitoring unit drives its peripherals, e.g. the digital/proportional controller.

Immediately after the compressed air supply is opened and the main voltage is applied, the internal self-check of the controller begins automatically. Any fault occurring during the self-check sequence is indicated by

FAULT
XX

An explanation of the fault numbers (XX) is given in the manual, section 3.5 "Faults and Troubleshooting", Table 1: Faults detected during the self-check.

If the self-check is carried out successfully, the initial purging of the enclosure commences, ending when at least five times the enclosure volume has been circulated. The purging process is indicated by the message

REMAINING
PURGE TIME:
XX MIN XX SEC

in the display. All the time, the remaining purging time is counted down to 00 min and 00 seconds.

After the end of the purging sequence, the Non-Ex units in the enclosure are switched on. The overpressure in the enclosure then constantly monitored for adherence to the setpoint value (factory setting: 2.0 mbar) and also for transgressing of the Min value (factory setting: 0.9 mbar) and exceeding of the Max value (factory setting: 20.0 mbar). Normal operation is indicated by the message

ENCLOSURE
PRESSURE:
XX..XX MBAR

in the display.

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Mod.

3 Behaviour of the controller during normal operation

In normal operation, the controller F-351 in the control cabinet ST-200C/CM monitors and regulates the internal pressure of the EEx-p enclosure to the setpoint value in relation to the surrounding atmosphere.

The limit values set in the factory are:

MIN: 0.8 mbar and MAX: 15.0 mbar.

At an increased level of internal enclosure pressure (over the limit value for Max) with regard to the surrounding atmosphere, the mechanical valve VA-100-3H opens automatically. This allows the excessive internal pressure to drop. The valve closes again when the internal enclosure pressure has again attained normal values (under the limit value for Max).

Function procedure of the EEx p system

After connecting the pressure supply and turn on the main switch (Pos.18) the purge valve (Pos.15), the proportional valve (Pos.14) and the outlet valve VA-100-3H are open.

Through the adjustment valve (Pos.12) and in addition through the proportional valve and the parallel mounted manual valve (Pos. 9) the pressure air reaches the motor enclosure and flees through the outlet valve VA-100-3H.

If the purge flow of the motor enclosure exceeds the adjusted minimum flow value, the purging sequence starts. The remaining purge time is displayed.

If the air flow through the motor during the purging sequence drops below the pressetted value for minimum flow, the purging sequence stops.

The required purging time depends on the setting of the purge volume (normally 10 times the free volume of the motor cabinet) and the pressetted inlet pressure at the pressure regulator (7).

After the purging sequence is finished:

The power supply of the purge valve (Pos.15) is cut off with the relay K3 in the EEx d box. Thereby the outlet valve VA-100-3H and the purge valve closes. The pressure air now flows only through the manual valve "leakage losses" and the proportional valve in the motor enclosure.

The required overpressure in the motor enclosure is now maintained by the proportional valve and the manual valve. Likewise due to compensation of leakage losses.

At the terminals –X2 9 and 10 in the EEx d box the signal "**ready to start**" is given.

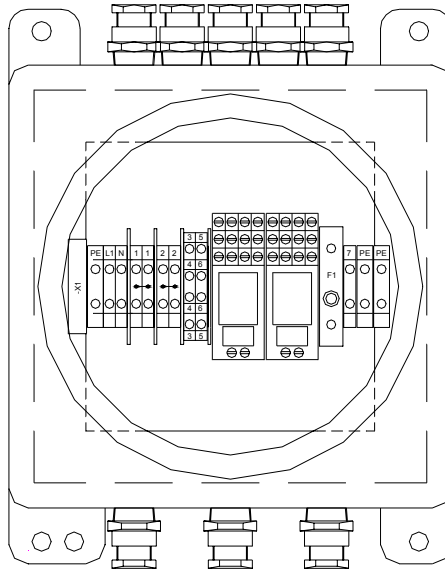
The overpressure in the motor enclosure is monitored by the pressure switches "**Min**" and "**Max**" of the control unit. If the overpressure drops below the pressetted value "**Min**", or exceeds the overpressure value "**Max**", then K2 and K3 in the EEx d box are switching and a signal is given to cut off the motor power.

To prevent a false alarm, as a result of pressure oscillations through the motor housing during the purging sequence, terminals 9 and 10 have a drop-out time delay of approx. 5 sec.

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EEx d junction and control box F-900.041

In the EEx d junction box are all needed functions for the potential free signals and terminals for power supply mounted. The power supply has to be connected



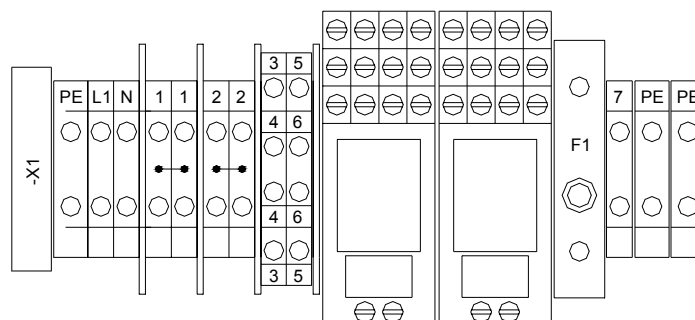
in this box.

The EEx d box consists of:

- 2 x PE terminals type USLKG 5
- 11 x terminals type UK5N
- 2 x relays with 4 switchover contacts (K2, K3)
- 1 x fuse holder
- 7 x bore holes ½" NPT
- 5 x EEx d cable glands type FL1 F1B (used by ELB)
- 1 x EEx d cable gland type FL1 I1B (used by ELB)
- 1 x EEx d cable gland type FL1 I1B (cable $\varnothing = 10,5 - 12$ mm) for power supply (customer)

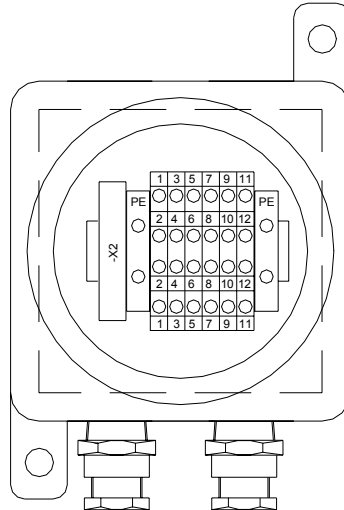
Cable glands for other diameters or armoured cables on request.

Terminal block



Änd./
Mod.**EEx d junction and control box F-900.001**

In this EEx d junction box all potential free signals can be picked off.

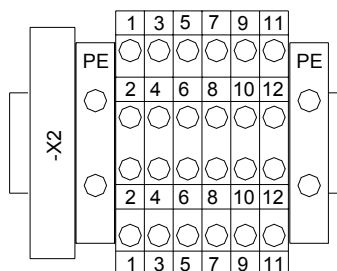


Terminal 1 and 2:	Motor shutdown
Terminal 3 and 4:	Purging in progress
Terminal 5 and 6:	Motor not purged
Terminal 7 and 8:	Purging sequence finished
Terminal 9 and 10:	Ready to start
Terminal 11 and 12:	Spare (wiring to F-900.041 terminals 5 and 6)

The EEx d box consists of:

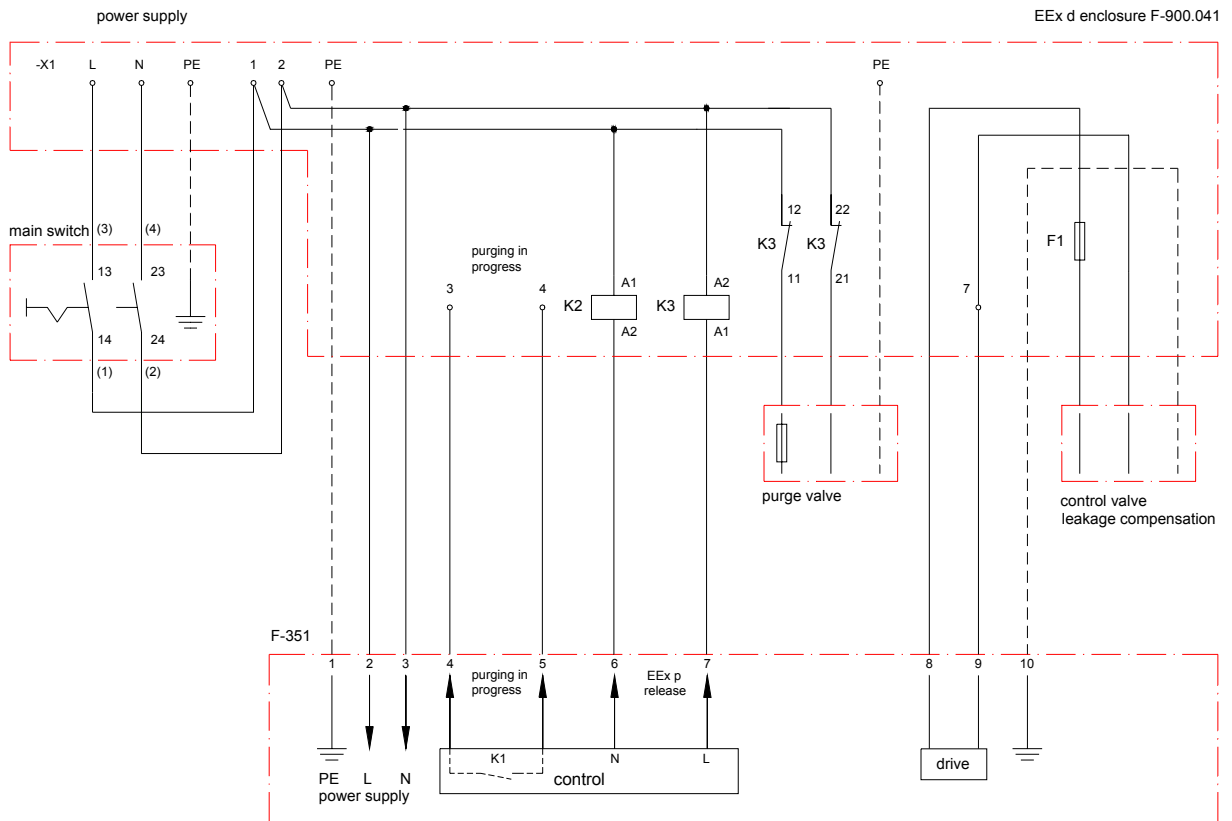
- 2 x PE terminals type USLKG 6
- 6 x terminals type UKK 5
- 1 x bore hole 1/2" NPT
- 1 x Bore hole 3/4" NPT
- 1 x EEx d cable gland type FL1 I1B (used by ELB)
- 1 x EEx d cable glands type FL1 I1B (cable $\varnothing = 10,5 - 12$ mm) for signal cables

Cable glands for other diameters or armoured cables on request.

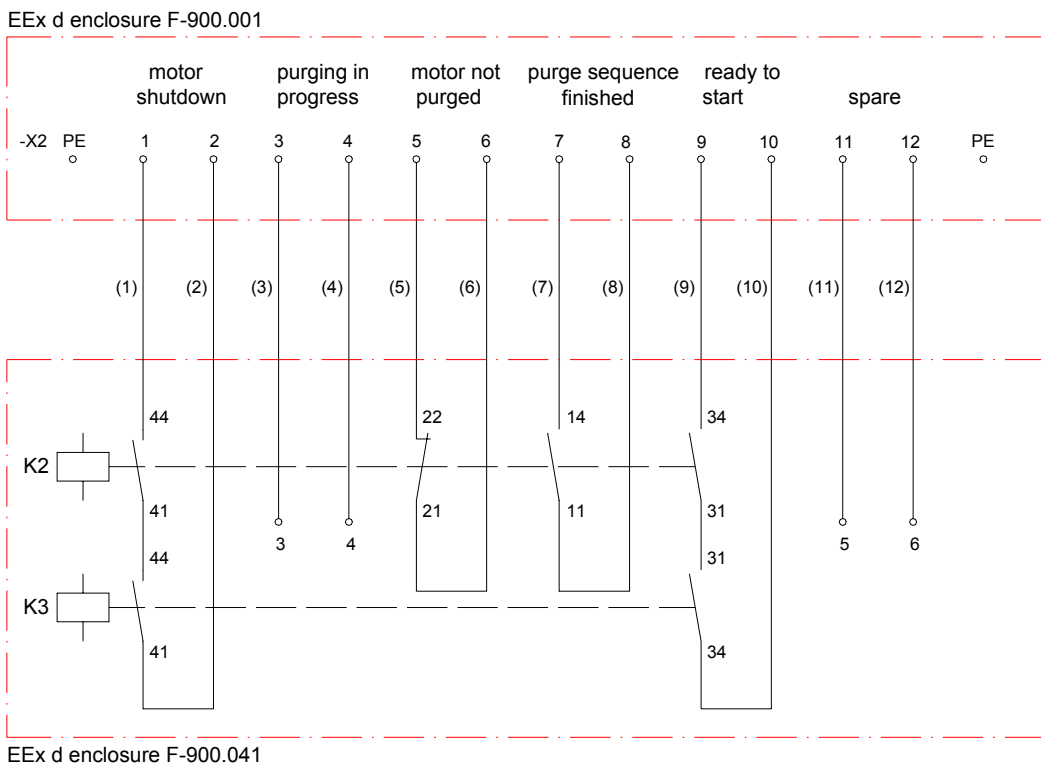
Terminal block

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Mod.



Wiring plan



Potential free contacts



Änd./
Mod.**Name plate**

E.L.B. EX-GERÄTE 		
D-64625 Bensheim		
EEx-p System Type <input type="text" value="F-361.C4"/>		
TÜV 02 ATEX 1801		
Operating voltage:	<input type="text"/>	VAC/48-62 Hz <input type="text"/> VDC
Motor Manufacturer:	<input type="text"/>	Order no.: <input type="text"/>
Project name:	<input type="text"/>	Project no.: <input type="text"/>
Serial no.:	<input type="text"/>	Date of pass: <input type="text"/>

For the identification of the system a stainless steel plate is fixed at the enclosure of the control cabinet.

Änd./
Mod.**Checklist and test certificate**

E.L.B. EX-GERÄTE —
D-64625 BENSHEIM

Test certificate and checklist for motor systems**customer:**

address:

motor system: F-361.C4**power supply:** ___ V ___ Hz**date of pass:** ___:___:___**serial number:** ___**order number:** _____**checked by E.L.B.**

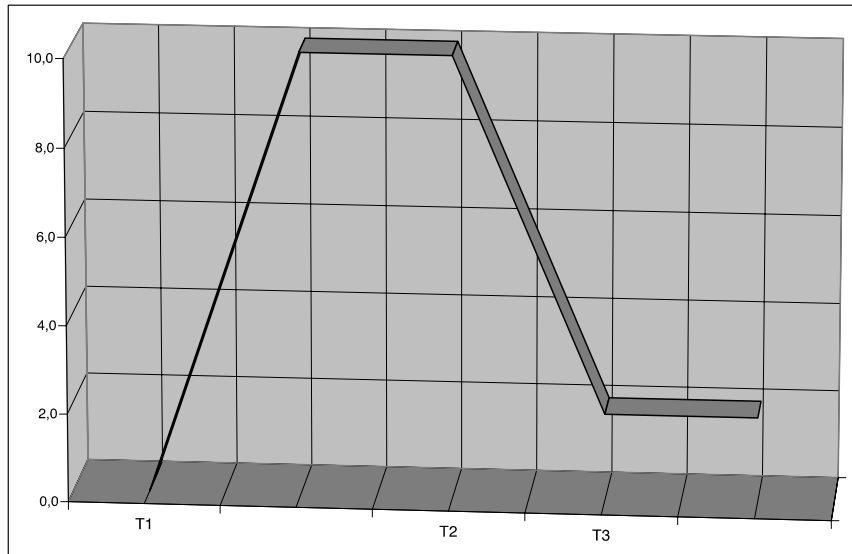
date:

name:

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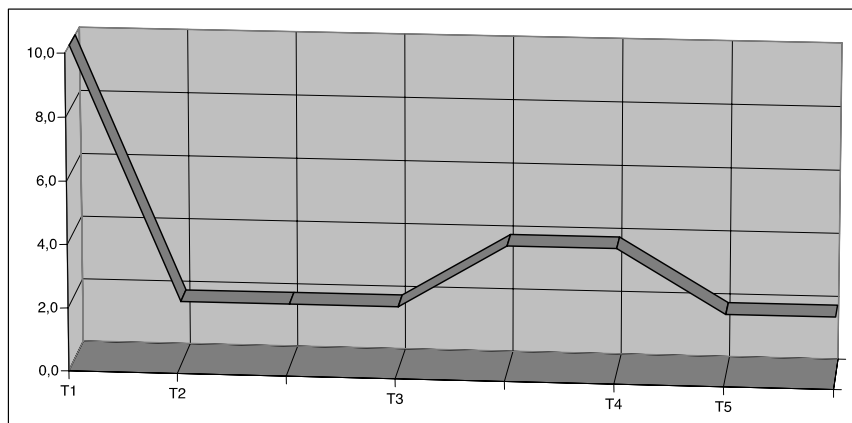
Appendix A

Timing diagram purging sequence



- T1: Switching on power supply and opening air pressure supply the control unit begins with a self test and the purging sequence of the EEx p motor enclosure starts. With an air flow which is higher than the adjusted value "min air flow" and the air flow is adequate the adjusted purge volume (min. 10-fold inner free motor volume), the motor enclosure is purged.
- T2: The purging sequence is finished. The adjusted motor enclosure overpressure is controlled by the leakage compensation (see chapter 5 of main manual). The Non- Ex units can be powered.
- T3: Normal operation starts.

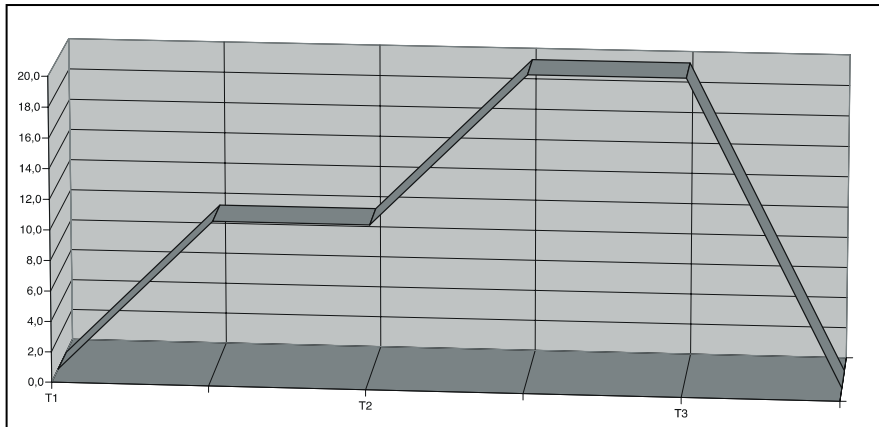
Timing diagram operating modus



- T1: The purging sequence is finished. The adjusted motor enclosure overpressure is controlled by the leakage compensation (see chapter 5 of main manual). The Non- Ex units can be powered.
- T2: Normal operation starts. The internal enclosure overpressure is regulated to the setpoint value.
- T3: The internal enclosure pressure rises.
- T4: The increased overpressure is controlled down with the proportional valve.
- T5: Normal operation begins.

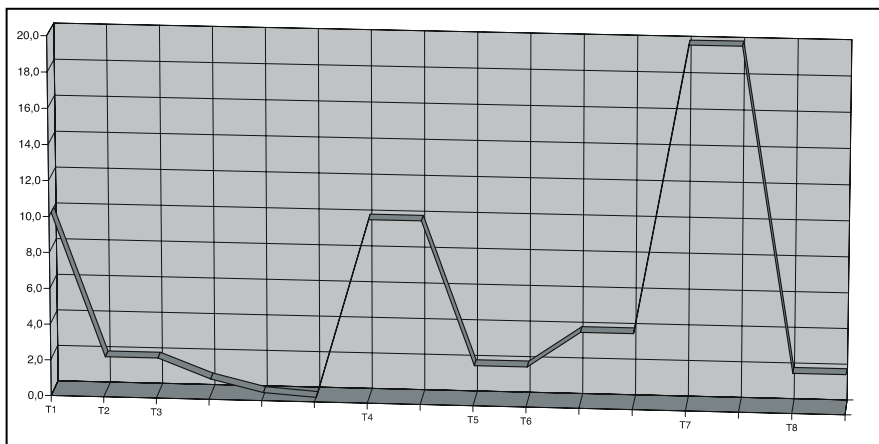
Änd./
Mod.

Timing diagram errors during purging sequence



- T1: Switching on power supply and opening air pressure supply the control unit begins with a self test and the purging sequence of the EEx p motor enclosure starts. With an air flow which is higher than the adjusted value "min air flow" and the air flow is adequate the adjusted purge volume (min. 10-fold inner free motor volume), the motor enclosure is purged.
- T2: During the purging sequence the internal overpressure increases to an excessively high value. The purge operation is aborted.
- T3: During the purging sequence the minimum air volume flow falls. The purging sequence is resetted.

Timing diagram errors during the operating modus

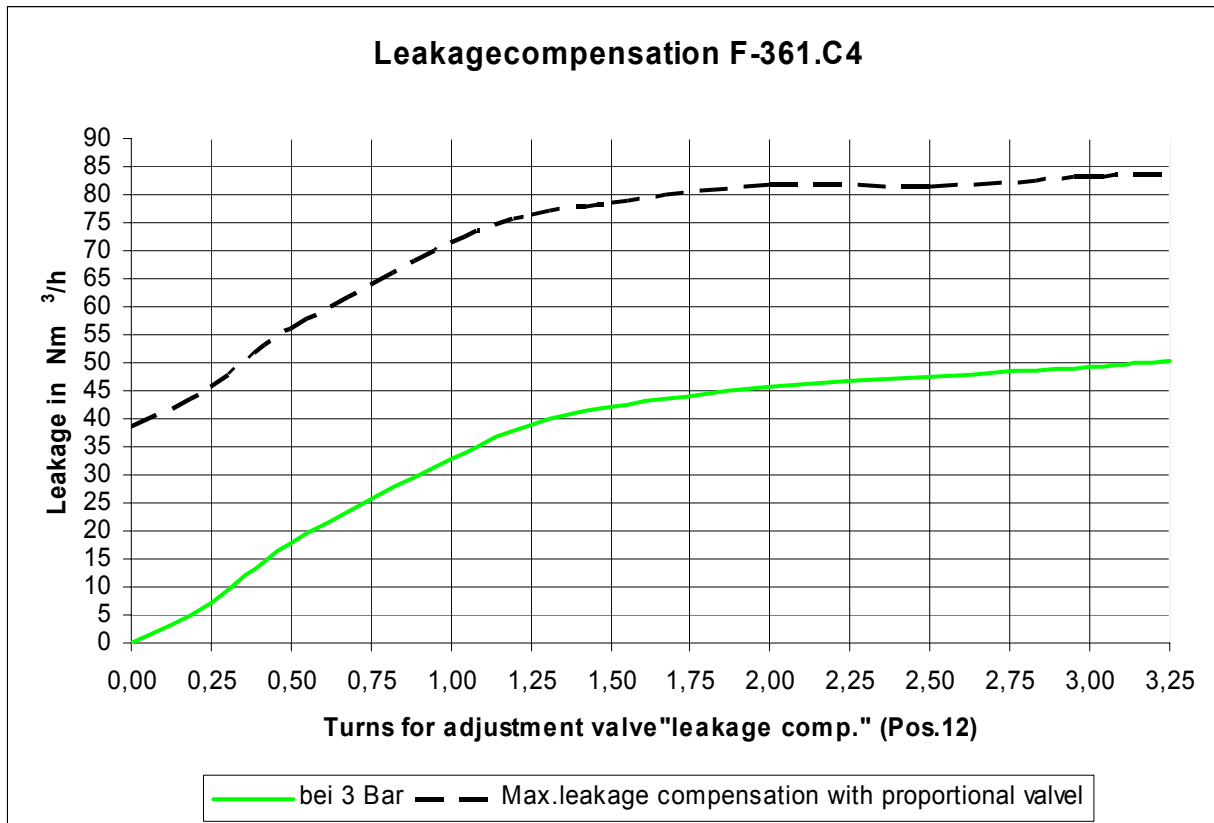


- T1: The purging sequence is finished. The adjusted motor enclosure overpressure is controlled by the leakage compensation (see chapter 5 of main manual). The Non- Ex units can be powered.
- T2: Normal operation starts. The internal enclosure overpressure is regulated to the setpoint value.
- T3: The internal enclosure pressure drops. If the pressure value falls below the switchpoint „Minimum pressure“ in relation to the external pressure, the Non- Ex units are switched off.
- T4: Renewed purge.
- T5: Normal operation begins.
- T6: The internal enclosure pressure rises. The increased internal enclosure pressure cannot controlled down.
- T7: If the internal pressure value exceeds the switchpoint „Overpressure“, the Non- Ex units are switched off. The purge valve is powered, so the outlet valve opens. The increased overpresse sinks to operation values.
- T8: After the pressure decrease, normal operation begins without purging.

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Leakage compensation diagram

To determine the approx. leakage of your purged motor enclosure during operation please count the turnarounds of the adjustment valve „leakage comp.“ (Pos.12) and use this diagram.



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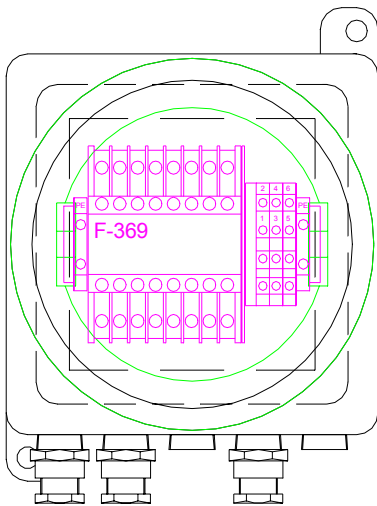
Option: Evaluation of additional signals

If wanted, the evaluation of more potential free signals is possible. Therefore the module F-369 will be mounted. This module is directly controlled via EEx i circuits of the control unit F-351.P. Each relay (K2, K3 and K4) is free programmable in his function. The module F-369 itself is mounted in an EE x d enclosure type F-900.031F369.

An exchange of the F-900.031F369 against the F-900.001 in already operating systems is only possible, if the control unit is also changed.

EEx d control box F-900.031F369

In this EEx d junction box all potential free signals can be picked off. Layout of the cable glands can be different from sketch.



Terminal 1 and 2:	Motor stop
Terminal 3 and 4:	Purging in progress
Terminal 5 and 6:	Operate
F-369 1/2 (K2):	free programmable
F-369 5/6 (K3):	free programmable
F-369 9/10 (K4):	free programmable

Power supply has to be connected to F-369 terminals 14 (PE)/15 (L1)/16 (N). The intrinsic safe circuit cable is direct wired to the socket at the left side of the control unit F-351.P.

The EEx d box consists of:

- 2 x PE terminals type USLKG 5
- 3 x terminals type UKK 5
- 1 x opto-relay module F-369
- 5 x bore hole 1/2" NPT
- 1 x EEx d cable gland type FL1 G1B (used by ELB)
- 1 x EEx d cable gland type FL 01 F1B for EEx i wiring (used by ELB)
- 1 x EEx d cable glands type FL1 I1B (cable $\varnothing = 10,5 - 12$ mm) for signal cable (client)

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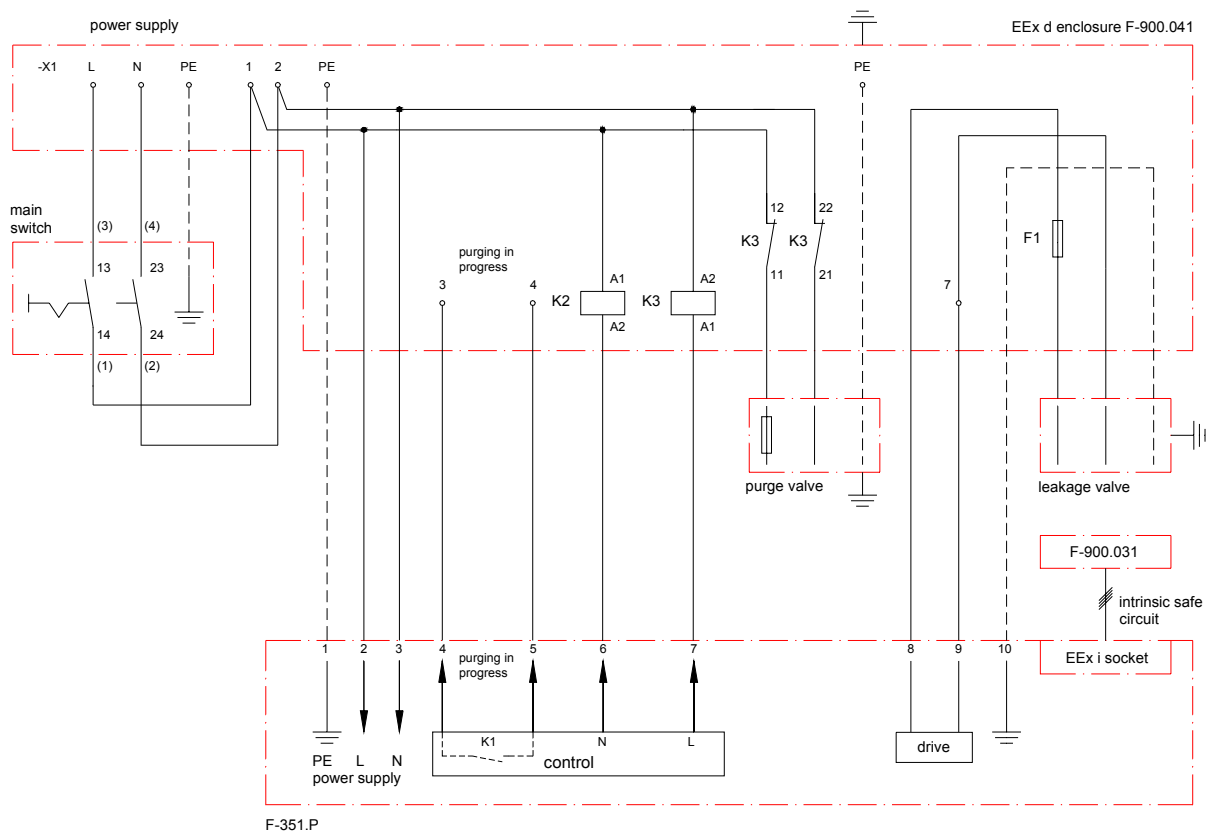
Programming the additional potential free contacts K2, K3, K4

All contacts can be programmed as NC or NO.

The function of each relay is programmable as listed:

isolation	contact switches simultaneous with contacts at terminals (6) and (7) of F-351
system fault	contact switches in case of a fault
malfunction 1 minute	contact switches 1 min after fault
malfunction flashing	contact switches 1 min after fault and switches over in a cycle of 1 sec
pre-alarm "Min"	when the internal enclosure pressure drops under the adjusted value of "Min", range 0,8 – 15 mbar
pre-alarm "Max"	switches when the internal enclosure pressure rises above the adjusted value of "Max", range 0,8 – 24 mbar
purge	contact switches during purging sequence
bypass	contact switches, if bypass key-switch is active
fault/bypass	fault: contact switches in case of a fault bypass: contact switches over in cycle of 1 sec

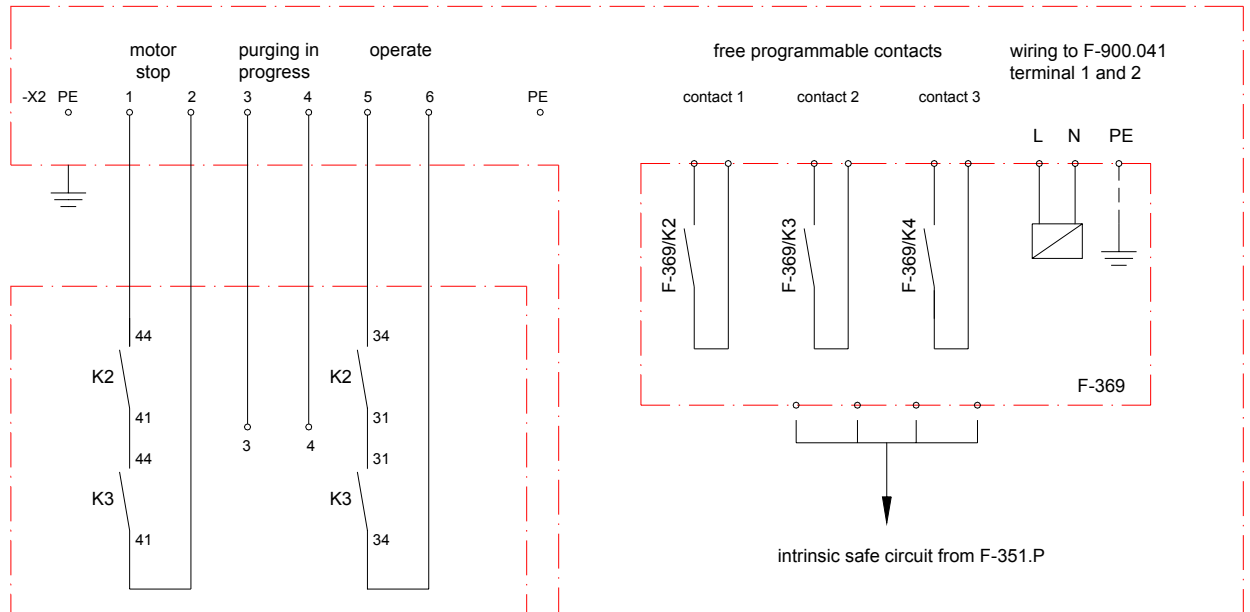
Extended wiring plan



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Potential free contacts

EEx d enclosure F-900.031



The electronic is designed to work according to the “closed-circuit principle”



We hereby confirm the conformity of the equipment listed below with the directives of the Council of the European Community. The safety and installation instructions of the product documentation must be observed.

Model: **EEx px Purge System F-35... and F-361.A4/.B4/.C4/.F4**, consist of:
-EEx px Controller F-351
-EEx m digital / proportional valves F-220.2/.2B/.3/.4
-EEx d box (es)
-EEx m main switch
-EEx d cable glands
-EEx e cable glands

Directive: EMC Directive 98/336/EC)*

European standards: EN 50081-1, 3/93*)
EN 50081-2, 3/93*)
EN 50082-1, 2/96*)
EN 50082-2, 2/96*)

Directive: Low Voltage Directive 73/23/EC*)

European standard: EN 61010-1 :3/94

Directive: ATEX 94/9/EC

European Standards: EN 60079-0 :2006
EN 60079-2 :2004
EN 60954-1 :1996
EN 60079-7 :2003
EN 60079-11:2007
EN 60079-18:2004

A quality management system according to DIN EN ISO 9001 (reg.-no. 8000307346) and ATEX 94/9 is established since 1998 and will be periodically supervised from a notified body (TÜV CE0032/ 0044).

Managing Director

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High-Flow Technology™ - trademark of the E.L.B. company. Permits low enclosure pressures even for high air flowrates

Wheel-Shuttle® - Patented and registered trademark of the University of Dresden and the E.L.B. company. Operating and parametrization for the EEx-p controller F-351 with simple, intuitive operator guidance.