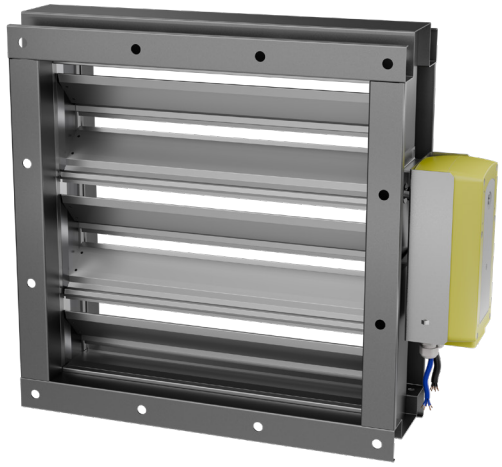
FlowShield
Marine Shutoff Damper

With ATEX rated Electrical (Schischek) Actuator



TYPE OF PROTECTION 'C'

II 2G Exh II C T6 Gb

II 2D Exh III C T85 Db

CSANe 24ATEX1281

EN ISO 80079-36:2016

EN ISO 80079-37:2016

1. Description

The ActionAir shut-off damper is designed to isolate duct runs and compartments against both hazardous and safe atmospheres. Tested to EN1751, it achieves class 3 blade leakage and class C case leakage, independently tested by BSRIA. It is suitable for Zone 1 atmospheres.

2. Tests, approvals and certification

- CSAcertification (Ex) category 2 equipment
- Corrosion Tested - EN60068-2-52 severity 2 conditions
- Vibration Tested – EN60068-2-6 (5Hz to 350Hz @2g)
- Case and leakage to EN1751. Case Class C and blade Class 3.

3. Health and Safety

- Care must be taken when installing and inspecting dampers, as they are likely to close without warning due to loss of electrical power. This is their prime function.
- **Do not introduce any items, fingers or limbs between the blades.**
- Larger dampers are heavy and must be handled in accordance with current local regulations and good practice.
- All wiring should be carried out in accordance with the wiring details provided, to the IEC regulations.

4. General Information

- The Actionair Marine Shutoff Damper is suitable for both vertical and horizontal applications, with airflow in either direction.
- The Actionair Marine Shutoff Dampers are supplied with the blades in the fully interlocked closed position to avoid damage during transit and installation. It is recommended that the dampers remain closed until actual date of commissioning. All dampers must be treated with care during handling, storage and installation.
- Actionair Marine Dampers are designed for applications in normal dry filtered air systems and should be subjected to a planned inspection programme.

5. Installation - see below.

6. Maintenance & Cleaning

- Dampers are supplied in two casing and blade material options: -

  1/ Galvanised Steel casing and 430 Stainless steel blades, only suitable for installation in dry filtered systems.

  2/ 316 Stainless steel casing and blades and drive - more suited for corrosive conditions, but even this will rapidly corrode and fail if not properly maintained, when used in air intake systems at sea. The addition of a mist eliminator is highly recommended, and access must be provided for maintenance.

actionair by Swegon

7. Testing

Two levels of testing exist.

- Routine testing - Monthly, or in accordance with maintenance programme, release and reset damper (via control system). Check remote indication or visual check of mechanical pointer as appropriate.
- Visual check at damper - At commissioning and at least once a year, check damper operation by removing and re-applying power to actuator.
- Visually check blades for damper closed and open positions.

Prove remote indication if applicable.

8. Routine Maintenance

- Depending upon environmental conditions, each damper will merit its own cleaning regime. Particularly hostile areas.
- 'Frequency of maintenance' should be determined by collecting historical data from previous visits, and for this reason, commence maintenance programmes.
- Dampers in 'Dry Filtered Air' require very limited maintenance. When exposed to fresh air intakes and/or inclement conditions this may require monthly cleaning and lubrication maintenance to be performed.

9. Cleaning

- Using light lubricant, clean all exposed surfaces, using a cloth.
- Remove all traces of surface staining, as this will deteriorate further causing deeper material corrosion.
- For 316 stainless steel blades and case, pay specific attention to the blade rivets where crevice corrosion will cause rapid failure of blades if not kept in check.
- If damper is stiff to operate lubricate blade ends, open and close damper successively until the damper moves with ease. (This may necessitate removal of the actuator and perating the blades manually by the drive shaft).
- Refit actuator and re-test.
- Clean off excessive lubricant.

10. Damper installation

All installations shall be carried out in accordance with the relevant Marine/Offshore Authority requirements.

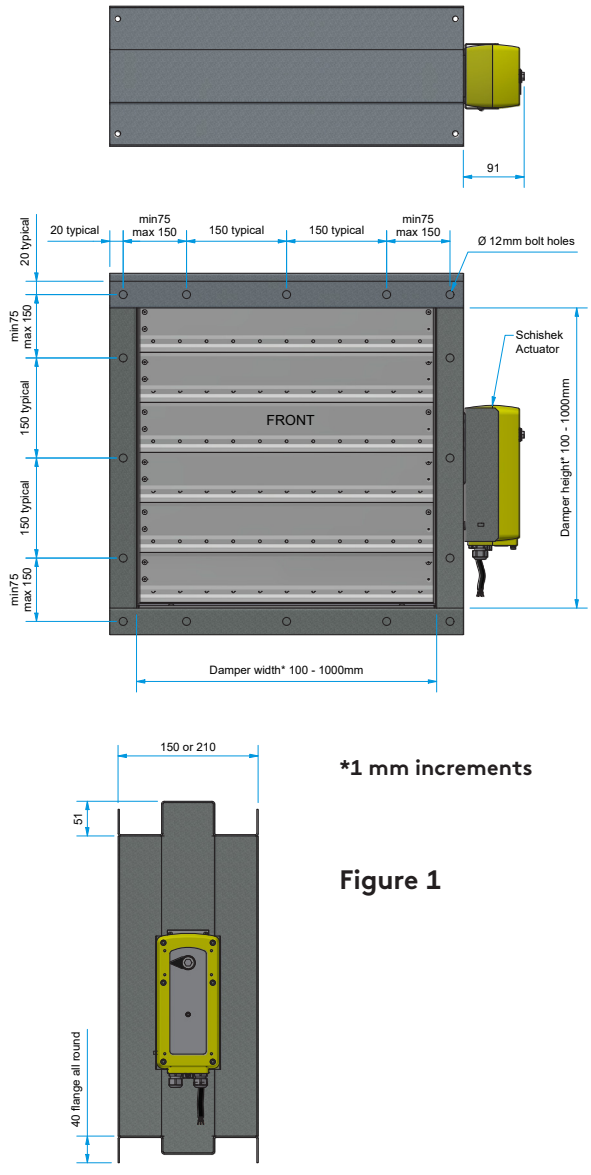
Bolt holes provided as standard on the damper flanges (unless otherwise stated) at 150mm maximum centres. Matching hole positions are necessary on mating coaming/duct flanges.

Apply sealant/gasket to mating flanges and position damper.

Bolt square/rectangular dampers using suitable steel bolts minimum M8 diameter and minimum M6 diameter on circulars.

Single Damper Assembly

Tested and approved to size of 1000x1000mm



***1 mm increments**

Figure 1

11. Control Modes (3 positions) (Refer to figure 5)

Two sizes of Control Modes are utilised - 5.10Nm & 15Nm. Correctly sized Control Modes are designed to fit only to the relevant sized damper. (See 'Control Mode Standard Parameters' figure 2)

Remove transit plate from damper mounting plate and recycle.

Mount actuator to damper mounting brackets & secure with screw & washer provided - 5Nm Max. (Refer to figure 4).

Its important to fit the 2 spacers provided. (Refer to figure 6) Never operate the manual override (shaft) when actuator is connected to power supply.

Actuators will only work if Safety temperature sensor (ExPro TT) is properly connected.

IMPORTANT - please ensure damper blades are in the fully closed position prior to mounting actuators. Failure to do so may damage drive shafts and render the damper inoperable.

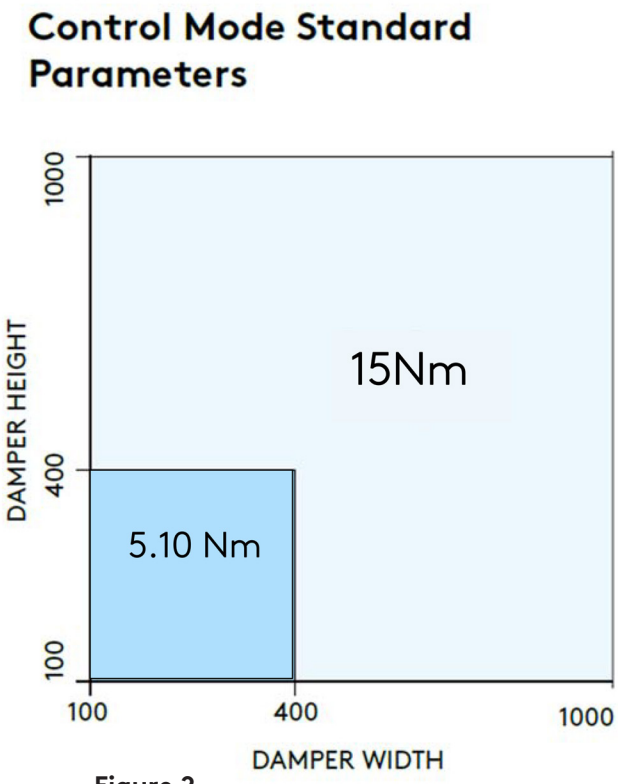


Figure 2

12. Mechanical Operation check

As an interim check, the damper should be manually reset and released using the manual reset key provided, (refer to Control Mode label) to ensure that correct mechanical operation is achieved. This feature may be used for system commissioning when electrical power is unavailable.

13. Electrical Connection and Final Operational Test

The unit must be wired as described in the Application and Wiring section 16. When power is available, the unit must be checked for electrical operation. Power to motor open, spring to close.

Schischek actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 VAC/DC. The supply unit is self-adjustable to the connected voltage! For electrical connection inside hazardous areas, an EEx-e terminal box, certified in accordance with ATEX is required (E.G ExBox XNNN00578)

Electrical ATEX (Ex) rated as below the associated electrical Control Modes are available in one Universal version with 24 – 230V AC/DC supply.

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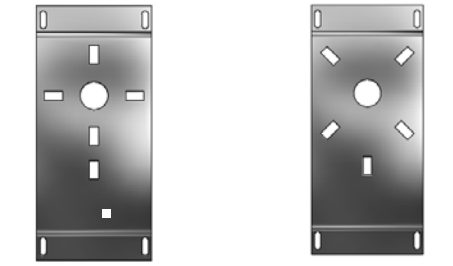
14. Actuator Installation

Actuator mounting brackets riveted to damper casing



Schischek 5.10Nm

Schischek 15Nm

Figure 3

15. Three position Actuator mounting & dimensional date

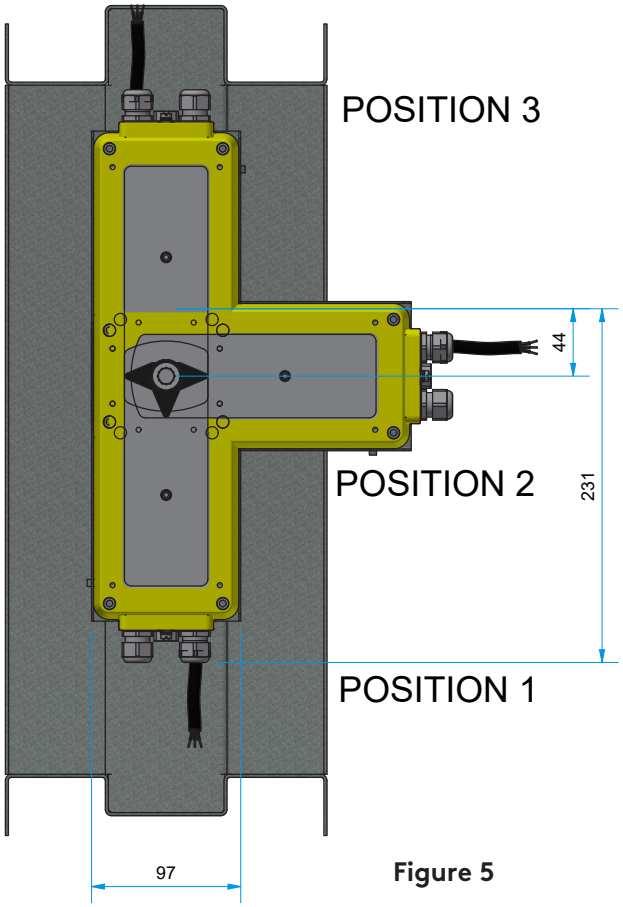


Figure 5

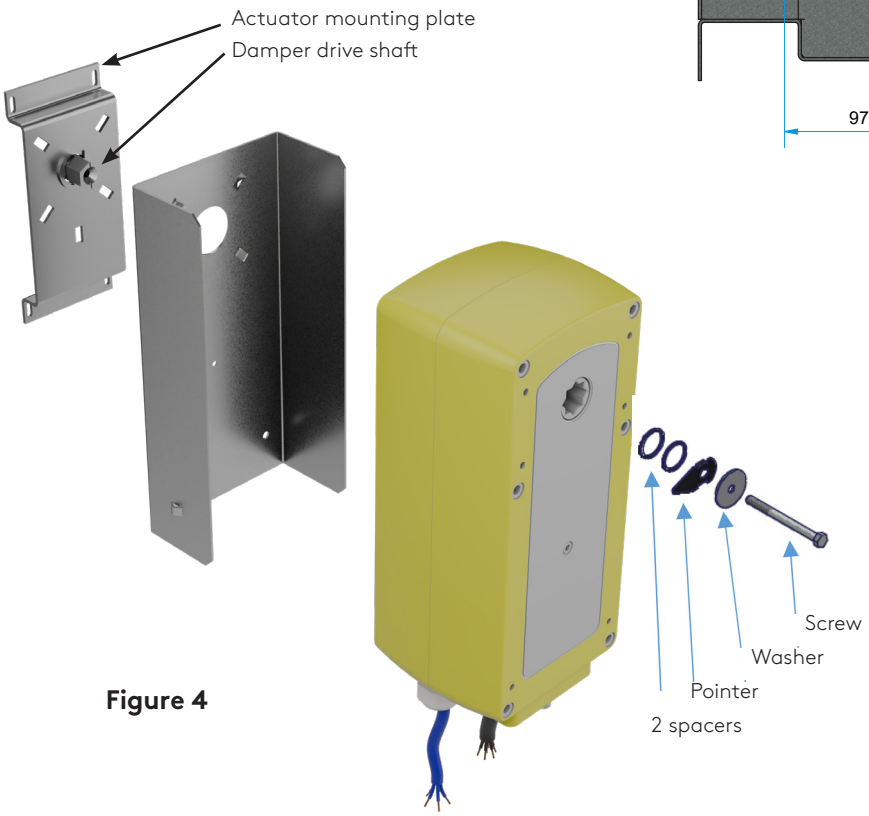


Figure 4

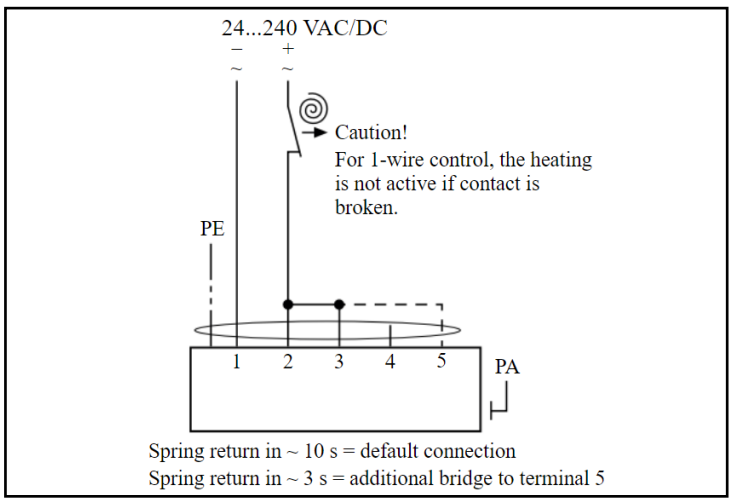
Detail A Earthing Boss for Atex Rating

Figure 6

16. Standard Application & Wiring

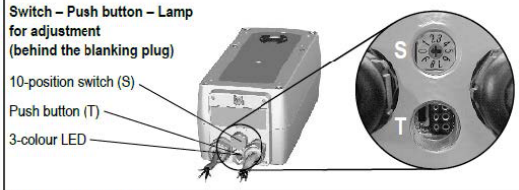
IMPORTANT: Please fully read the Schischek data sheets provided with every actuator

For 5.10 actuators 10Nm & 3 sec/90° must be selected.
For 15Nm actuators 3 sec/90° must be selected.
Make sure that 1 cycle per minute is not exceeded.



Parameters, adjustments and failure indication

Switch – Push button – Lamp for adjustment (behind the blanking plug)



Parameter selection

Example:
ExMax-5.10-BF

Requested parameter:
Torque 10 Nm
Motor running time 60 s/90°

Result:
Switch position 08

Type		Torques	
ExMax- 5.10 -BF ▶		5 Nm	10 Nm
ExMax- 15 -BF ▶		15 Nm	
		▼	▼
Running times		**Position of switch (S)**	
3	s/90° ▶	00	05
15	s/90° ▶	01	06
30	s/90° ▶	02	07
60	**s/90° ▶**	03	**08**
120	s/90° ▶	04	09

Functions, adjustments and parameters

A) Self adjustment of angle of rotation
Turn switch (S) to position 02 (low torque) or 07 (high torque). Press button (T) for a minimum of 3 seconds. The actuator drives to both end positions and detects the blocking positions. The LED flashes GREEN during adjustment.
The adjustment takes about 60 seconds (30 sec. "On", 30 sec. "Off").

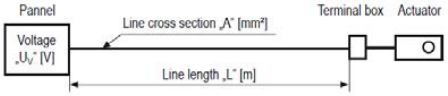
B) Selecting motor running time and torque
Adjust parameters only if actuator is in idle state or without applied potential.
Turn switch (S) to the position required for the intended operation acc. to table above. The selected parameters will be carried out at the actuator's next operation.

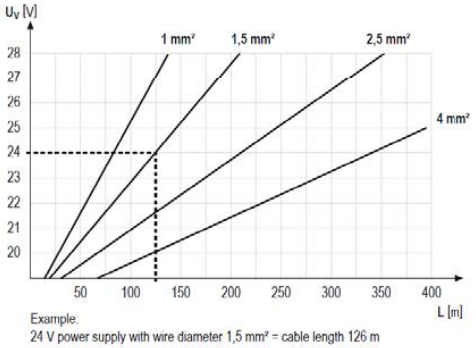
C) Selecting spring return time
Spring return time is selected by wiring.

D) Function of the ExPro-TT-... in the Ex-i tripping circuit
When the ...Pro-TT's tripping circuit is opened the actuator runs into its end position with spring return.

► Cross sections of the inlet line

On long distances between voltage supply and drive, voltage drops occur due to line resistances. As a consequence with 24 VAC/DC the actuator receives a too low tension and does not start. In order to prevent this the cross section of the inlet line is to be dimensioned accordingly.
The accompanying formulas allow the calculation of the necessary line cross section respectively maximal permitted conduit length respectively utilizing the existing line cross section.
Alternatively the secondary voltage can be increased by selecting a transformer.





Example:
24 V power supply with wire diameter 1,5 mm² = cable length 126 m

Required **cable cross section A** at existing cable length L

$$A = 0{,}0714 \times L : (U_V - 18\ V)$$

Example: L = 250 m, U_V = 30 V
Cross section A = 1,5 mm²

Maximum **cable length L** at existing cross section A

$$L = A \times (U_V - 18\ V) : 0{,}0714$$

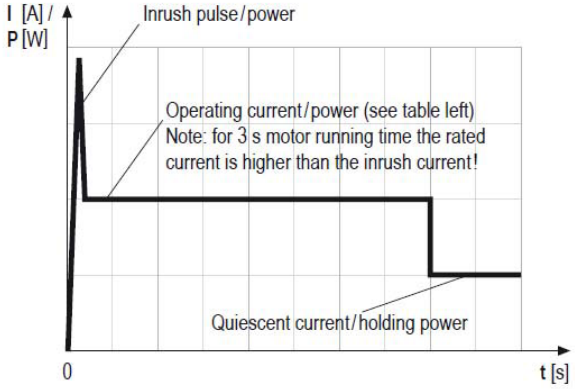
Example: A = 1,5 mm², U_V = 24 V
Length of cable L = 126 m

For calculation following characteristics are essential:
U_V = supply voltage [V]
A = line cross section [mm²]
L = conduit length [m]
Factor 0,0714 = drive specific factor [Vmm²/m]
(based on the electrical conductivity of electrolytic copper with a coefficient of 56 m/Ωmm²)

► Power input depending on supply voltage

The design of the on-site supply depends on the selected motor running time and selected supply voltage. Accompanying values are "about values" since there can be construction unit dispersions within electronics. The holding power is run time independently typical at ~ 5 W. The power consumption for the heater is ~ 16 W. In the heating phase the motor is not active!
The initial starting supply voltage required by the actuators power supply unit is ~ 2.0 A. The starting pulse takes about 1 sec. (please consider this while concepting the cross section of the supply line). The power factor is between 0.8 and 0.5 in dependence of motor running time. A line protection should be min. 2 AT.

		Rated current in acc. with motor running time				
Voltage	**Current**	**3 / 7,5 s**	**15 s**	**30 s**	**60 s**	**120 s**
24 V DC	$I_{Nominal}$	4,70 A	1,30 A	0,70 A	0,60 A	0,50 A
120 V AC	$I_{Nominal}$	0,75 A	0,30 A	0,25 A	0,20 A	0,17 A
240 V AC	$I_{Nominal}$	0,37 A	0,15 A	0,12 A	0,10 A	0,08 A



EEx-i intrinsic safe data

U_0 = 10,6 V
I_0 = 11 mA
P_0 = 30 mW
C_i = 0
L_i = 0

	IIC	IIB	IIA
C_0	830 nF	3,7µF	4,5 µF
L_0	2 mH	5 mH	10 mH

Ex-i intrinsic safe data – for temperature trigger ExPro-TT T 1.0

U_o = 10,6 V
I_o = 11 mA
P_o = 30 mW
C_i = 0
L_i = 0

	IIC	IIB	IIA
L_o	2 mH	5 mH	10 mH
C_o	830 nF	3,7 µF	4,5 µF

Trouble shooting:

Fault	Possible problem	Recommended action
Control Mode does not fit to damper drive shaft when Control Mode is correctly positioned	Damper shalf not in 'danger closed' position	Damper shalf has an 'indication groove' which is parallel to damper blades. Damper must be in closed position before fitting Control mode
Control Mode does not operate electrically	Mode wired incorrectly/No power	Refer to above wiring diagram
Control Mode operated, but limited or no movement of damper blades evident	Damper/Control Mode positions not synchronised	Remove Control Mode. Check damper closed (see indication Groove on damper shalf), and Control Mode released. Refit Control Mode
	Obstruction impeding damper blade	Check visually, remove obstruction. If necessary, remove Control Mode and operate damper drive shalf with14mm A/F spanner
	Over tightening of M5 x 80mm screw. (3 position only)	Loosen screw to 5Nm torque

17. Ignition Hazard Assessment

IGNITION HAZARD ASSESSMENT EN ISO 80079-36																	
No.	1		2					3			4						
	Ignition hazard		Assessment of frequency of occurrence without application of additional measures					Measures applied to prevent the ignition source becoming effective			Frequency of occurrence incl. measures applied						
	A	B	A	B	C	D	E	A	B	C	A	B	C	D	E	F	
	Potential ignition source	Description / basic cause	During normal operation	During foreseeable malfunction	During rare malfunction	Not relevant	Reasons for assessment	Description of the measure applied	Basis	Technical ocumentation	During normal operation	During foreseeable malfunction	During rare malfunction	Not relevant	Resulting EPL in respect of this ignition hazard	Necessary restrictions	
1	Hot surface	Heat transfer through the damper case	X				Metallic damper case will conduct heat from gas travelling through	Damper to have maximum temperature rating. Actuator thermal fuse will operate at approximately 74C or when there is no power supplied to the damper. The case and blades are still thermally conductive once closed. However, the flow of gas travelling through the damper will be stopped.	EN ISO 80079-36, clause 6.2				X		Gb Db	T6	
2	Hot surfaces	Exposed hot surfaces of the electrical components			X		Excess temperature rise due to poor ventilation or build up of dirt Excess temperature rise due to overloading	Reliance is placed up on suitably ATEX certified Components. Operation, use and maintenance will be in accordance with the components' manufacturer instructions.	EN ISO 80079-36				X		Gb Db		