KTC SYSTEMTECHNIK

Valve automation

KTC-Systemtechnik your partner for actuation safety quality ex proof electro hydraulic valve automation compact actuators quarter turn or linear hydraulic station with actuators development

KTC Systemtechnik GmbH

Your partner for valve automation

The pleasure of engineering and development of solutions for industrial automation was the initial incentive for KTC Systemtechnik.
Klaus Seiler and Carsten Teichler, both experienced in the automation business for many years, established KTC Systemtechnik in 2010.
Our technical team consist of employees, experienced in electrical engineering, hydraulics, mechanical engineering as well as control engineering (PLC).

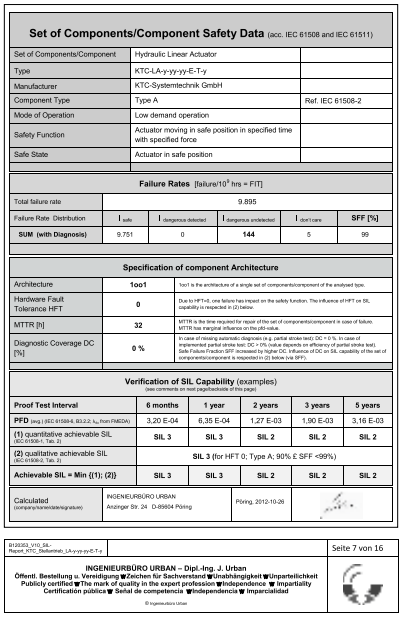
The company premisis for production and administration cover about 500m²

Since the founding of KTC, many interesting and large projects are realised. Our customers are valve manufacturer and engineering companies as well as end user from different areas like power stations, oil&gas, pipelines and chemical industries.
Our company objectives are the satisfaction of our customers, employees and business partners.
Hence, we develop our products and services continously. Regular professionel education is self-evident.

KTC Systemtechnik GmbH

Quality

Safety



Set of Components/Component Safety Data (acc. IEC 61508 and IEC 61511)

Set of Components/Component	Hydraulic Linear Actuator	
Type	KTC-LA-y-yy-yy-E-T-y	
Manufacturer	KTC-Systemtechnik GmbH	
Component Type	Type A	Ref. IEC 61508-2
Mode of Operation	Low demand operation	
Safety Function	Actuator moving in safe position in specified time with specified force	
Safe State	Actuator in safe position	

Failure Rates [failure/10^9 hrs = FIT]

Total failure rate	9.895				
Failure Rate Distribution	λ_{safe}	$\lambda_{dangerous\ detected}$	$\lambda_{dangerous\ undetected}$	$\lambda_{don't\ care}$	SFF [%]
SUM (with Diagnosis)	9.751	0	**144**	5	99

Specification of component Architecture

Architecture	**1oo1**	1oo1 is the architecture of a single set of components/component of the analysed type.
Hardware Fault Tolerance HFT	**0**	Due to HFT=0, one failure has impact on the safety function. The influence of HFT on SIL capability is respected in (2) below.
MTTR [h]	**32**	MTTR is the time required for repair of the set of components/component in case of failure. MTTR has marginal influence on the pfd-value.
Diagnostic Coverage DC [%]	**0 %**	In case of missing automatic diagnostic (e.g. partial stroke test) DC = 0 %. In case of implemented partial stroke test: DC > 0% (value depends on efficiency of partial stroke test). Safe Failure Fraction SFF increased by higher DC. Influence of DC on SIL capability of the set of components/component is respected in (2) below (via SFF).

Verification of SIL Capability (examples)
(see comments on next page/backside of this page)

Proof Test Interval	6 months	1 year	2 years	3 years	5 years
PFD (avg.) (IEC 61508-6, B3.2.2, λ_{du} from FMEDA)	3,20 E-04	6,35 E-04	1,27 E-03	1,90 E-03	3,16 E-03
(1) quantitative achievable SIL (IEC 61508-1, Tab. 2)	**SIL 3**	**SIL 3**	**SIL 2**	**SIL 2**	**SIL 2**
(2) qualitative achievable SIL (IEC 61508-2, Tab. 2)	**SIL 3** (for HFT 0; Type A; 90% ≤ SFF <99%)				
Achievable SIL = Min {(1); (2)}	**SIL 3**	**SIL 3**	**SIL 2**	**SIL 2**	**SIL 2**

Calculated (company/name/date/signature): INGENIEURBÜRO URBAN, Anzinger Str. 24 D-85604 Pöring, Pöring, 2012-10-26

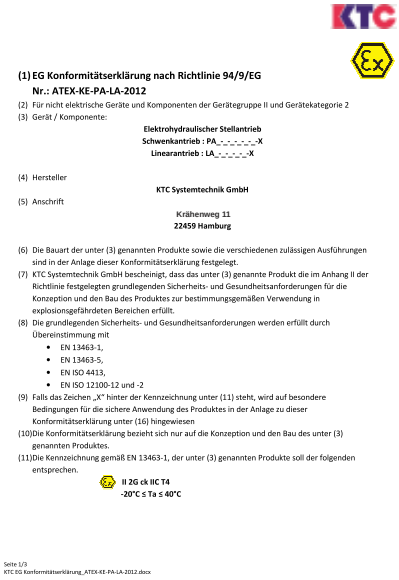
B120823_V10_SIL-Report_KTC_Stellantrieb_LA-y-yy-yy-E-T-y

Seite 7 von 16

INGENIEURBÜRO URBAN – Dipl.-Ing. J. Urban
Öffentl. Bestellung u. Vereidigung ☛Zeichen für Sachverstand ☛Unabhängigkeit ☛Unparteilichkeit
Publicly certified ☛The mark of quality in the expert profession ☛Independence ☛ Impartiality
Certification pública ☛ Señal de competencia ☛Independencia ☛ Imparcialidad

© Ingenieurbüro Urban

Hazardous areas



(1) EG Konformitätserklärung nach Richtlinie 94/9/EG
Nr.: ATEX-KE-PA-LA-2012

(2) Für nicht elektrische Geräte und Komponenten der Gerätegruppe II und Gerätekategorie 2

(3) Gerät / Komponente:

Elektrohydraulischer Stellantrieb
Schwenkantrieb : PA_-_-_-_-_-X
Linearantrieb : LA_-_-_-_-_-X

(4) Hersteller

KTC Systemtechnik GmbH

(5) Anschrift

Krähenweg 11
22459 Hamburg

(6) Die Bauart der unter (3) genannten Produkte sowie die verschiedenen zulässigen Ausführungen sind in der Anlage dieser Konformitätserklärung festgelegt.

(7) KTC Systemtechnik GmbH bescheinigt, dass das unter (3) genannte Produkt die im Anhang II der Richtlinie festgelegten grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau des Produktes zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen erfüllt.

(8) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

- EN 13463-1,
- EN 13463-5,
- EN ISO 4413,
- EN ISO 12100-12 und -2

(9) Falls das Zeichen „X" hinter der Kennzeichnung unter (11) steht, wird auf besondere Bedingungen für die sichere Anwendung des Produktes in der Anlage zu dieser Konformitätserklärung unter (16) hingewiesen

(10) Die Konformitätserklärung bezieht sich nur auf die Konzeption und den Bau des unter (3) genannten Produktes.

(11) Die Kennzeichnung gemäß EN 13463-1, der unter (3) genannten Produkte soll der folgenden entsprechen.

II 2G ck IIC T4
-20°C ≤ Ta ≤ 40°C

Seite 1/3
KTC EG Konformitätserklärung_ATEX-KE-PA-LA-2012.docx

European and international norms and directives are the guidline for a quality system. We understand the use of these rules as a helpful guide for our corporate divisions.

Compliance with standards ensures consistent and internationally recognised quality.

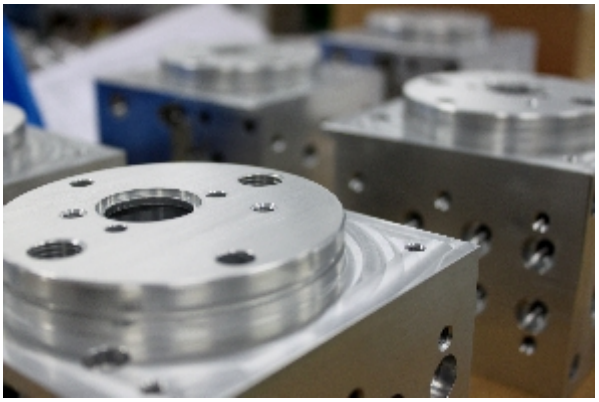
Our products comply with current standards and guidelines. Out of our own conviction and as proof of quality for our customers and suppliers, we are certified according to EN ISO 9001:2015

Norms and directives:

- ATEX 2014/34/EU
- DIN EN 13463
- 2006/42/EG
- EN ISO 12100
- EN ISO 13849
- EN ISO 4413
- DIN EN 61511-1
- ISO 9001: 2015

Valve automation

Electro hydraulic



Hydraulic valve block
of actuator type PA

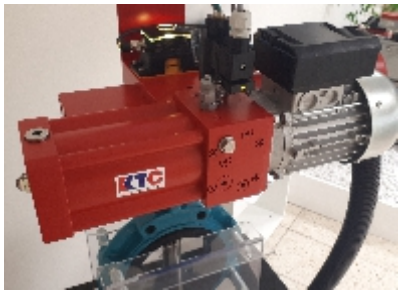
Extremely high force potential, precise control, high power transmission and high speed are the common advantages of hydraulic systems. In addition, fewer moving parts reduces wear out and cut maintenance.

The combination of high performance valves and open and close loop control electronics enables a very accurate positioning at high load and high speed. With these requirements, electric or pneumatic actuators dropped out.
The high power density of hydraulic systems allows a very compact design of actuators and power packs.
We develop and deliver all ranges of actuators for valve control. We have a large range of compact actuators for linear and quarter turn applications as well as large power units to run many actuators with on pressure supply only.
Engineering, design, assembly and testing carried out in our Hamburg location.

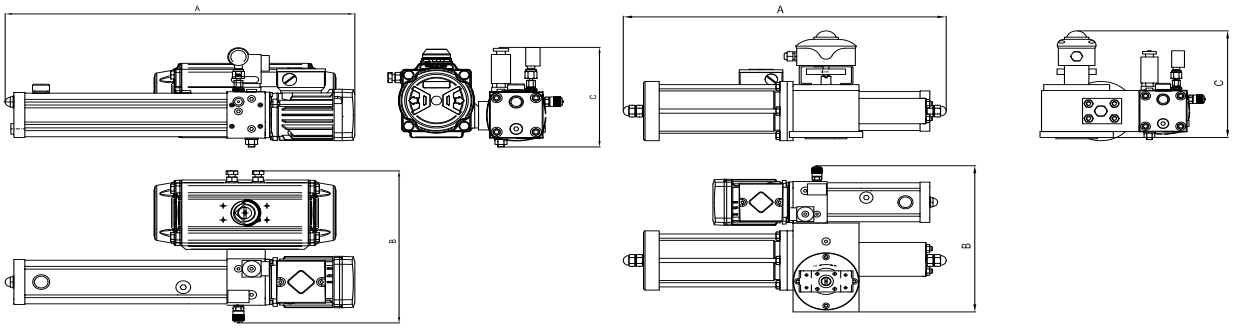
KTC Compact actuator
at temperature test
-38 °C

Compact actuators

1/4 turn actuators Linear actuators



In general, our compact actuators are to operate similar to electric actuators. Electric connections are power supply for pump motor and limit switch control only. In case of spring return, the actuator comes with a 24VDC/230VAC solenoid valve.
With the block design, no hydraulic connections are visible.



Due to modular design, the KTC power pack can be used for all different types of actuators.
The advantages of KTC actuators:

- High speed
- Safety/Fail-Safe (at power failure)
- High torque and thrust
- Accuracy
- Avoidance of water hammer

KTC SYSTEMTECHNIK

Industrieautomation · Steuerungstechnik · Stellantriebe
Industrial Automation · Engineering · Valve Automation

KTC Systemtechnik GmbH
Krähenweg 11
22459 Hamburg
Tel.: 040/5714 752-0
Fax: 040/5714 752-22
info@ktc-systemtechnik.de
www.ktc-systemtechnik.de