



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx PRE 20.0046X**

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Certificate history:

Status: **Current**

Issue No: 3

[Issue 2 \(2024-11-29\)](#)

[Issue 1 \(2023-01-04\)](#)

[Issue 0 \(2020-09-29\)](#)

Date of Issue: 2025-05-05

Applicant: **Rotex Manufacturers and Engineers Private Limited**
R-852/853, MIDC, TTC Industrial Area,
Rabale, Maharashtra.
Navi Mumbai 400 701
India

Equipment: **Self-Contained Electro-Hydraulic Actuator / Electric Fail Safe Actuator, Type: EHF Series**

Optional accessory:

Type of Protection: **Ex db, Ex tb, Ex h**

Marking: **Ex db h IIC T4 Gb**

Ex h tb IIIC T135°C Db

Tamb:

-20°C ≤ Ta ≤ +70°C

-50°C ≤ Ta ≤ +70°C

Approved for issue on behalf of the IECEx
Certification Body:

Asle Kaastad

Position:

Certification Manager

Signature:
(for printed version)

Date:
(for printed version)

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DNV Product Assurance AS
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Norway





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Rabale, Maharashtra.
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Manufacturing locations: **Rotex Manufacturers and Engineers Private Limited**
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This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2022 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
Edition:3.0

ISO 80079-36:2016 Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic methods and requirements
Edition:1.0

ISO 80079-37:2016 Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"
Edition:1.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

NO/PRE/ExTR20.0050/00
NO/PRE/ExTR20.0050/03

NO/PRE/ExTR20.0050/01

NO/PRE/ExTR20.0050/02

Quality Assessment Report:

IN/KLCS/QAR23.0008/00



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

EHF series Self-Contained Electro-Hydraulic Actuator/Electric Fail Safe Actuator mainly comprises of EHF housing, Main Manifold and Integral Squirrel cage/DC Motor Assembly. One thermostat of 125°C/ 132°C is installed within the motor windings.

The EHF Housing has three interconnected compartments with Individual covers

- Terminal Compartment with integral Terminal Blocks for mounting terminals
- Controller Compartment with LCD Cover, Where the Cover has the glass window cover and controller assembly and compartment house the electronics.
- Limit Switch compartment with LED Cover and for LED Indication and houses Solenoid Valves, Pressure Transmitter/Transducer, also it may consist Limit Switch and Position Transmitter/Transducer Assembly.

The equipment also contains manifold assembly which is protected by type of protection Ex h. Oil tank containing hydraulic oil is mounted on manifold assembly, Oil grades for specific ambient range is mentioned in Table 2 below. The equipment is made from cast aluminium alloy LM 6, alternate material may be stainless steel grade CF8 / CF8M or carbon steel WCB 216 or SG Iron 520/7.

Terminal box cover is fixed on EHF housing with socket head cap screws of size M8 X 30L (Qty.- 6 nos.) forming a spigot joint. O-ring (Ø3.53mm) made of Nitrile rubber (NBR) / FluoroSilicone Rubber (FVMQ) is provided on terminal box cover and secured in O-ring groove. Glass window is cemented on controller assembly cover. The controller assembly cover is fixed on EHF housing with socket head cap screws of size M8 X 30L (Qty.- 8 nos.) forming a spigot joint. O-ring (Ø3.53mm) made of Nitrile rubber (NBR) / FluoroSilicone Rubber (FVMQ) is provided on controller assembly cover and secured in O-ring groove. Plastic knobs (Qty.- 02 numbers) are provided on controller assembly cover, the knobs are magnetically latched to the sensor mounted inside the enclosure for local controls.

The limit switch assembly cover is fixed on EHF housing with hex. head screws of size M12 X 35L (Qty.- 6 nos.) forming a spigot joint. O-ring (Ø2.62mm) made of Nitrile (NBR) rubber / FluoroSilicone Rubber (FVMQ) is provided on limit switch assembly cover and secured in O-ring groove. Operating rod pass through the cover. On top of the cover, indicator cover made of Polycarbonate plastic material is provided to indicate position of valve "Open/ Close", alternatively cover may have LED Indication option.

Manifold assembly is fixed on EHF housing with hex. head screws of size M12 X40L (Qty.- 4 nos.) forming a spigot joint. O-ring (Ø2.62mm) made of Nitrile (NBR) rubber / FluoroSilicone Rubber (FVMQ) is provided on manifold housing and secured in O-ring groove.

Motor is mounted on manifold with socket head cap screws of size M8 X 30L (Qty.- 4 nos.) forming a spigot joint. O-ring (Ø3.53mm) made of Fluorocarbon rubber (Viton) / FluoroSilicone Rubber (FVMQ) rubber is provided between motor flange and manifold and secured in O-ring groove. The equipment carries degree of protection IP67 and found to be comply with IEC 60529.

Motor cable is running through the cavity in the manifold to the terminal box assembly for supply connection. The nickel plated phosphor bronze bush is forming cylindrical joint with manifold and motor shaft.

Internal gross volume of the EHF housing is 20.17 litre and net volume is 9.47 litre.

The equipment is provided with maximum six cable entries of size M25 X 1.5P and one cable entry of size M32 X 1.5P with threaded axial length of 16 mm. Alternate size of the cable entry can be six cable entries of size 3/4" NPT and one cable entry of size 1 1/4" NPT or six cable entries of size M20 X1.5P and one cable entry of size M25 X 1.5P.

Continuous duty operation of the equipment when the motors are de-rated to 50% of the rated power.

The actuator may have following cover options:

- Controller assembly cover- LCD Cover V2 (Glass Window - 105 X 65 mm)
- Controller assembly cover- LCD Cover (Glass Window - $\approx$ 65 mm)
- Limit Switch assembly cover – LED Indication (Glass Window - $\approx$ 47 mm)
- Limit Switch assembly cover – Mechanical Indication
- Terminal Box Cover- Blind cover

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. It is the responsibility of the installation engineer to ensure that suitably IECEx equipment certified Ex db, Ex tb, IIC cable glands and blanking plug are installed in accordance with IEC60079-14 to ensure that the IP rating of IP67 is maintain on the enclosure.
2. It is the responsibility of the installation engineer to ensure that suitably rated cable and cable glands are used to install this equipment. see product label and instruction "Use Cable and Cable Glands suitable for 75°C."
3. Dust layers shall be prevented from building up on the outside surface of the enclosure, and the enclosure shall be routinely cleaned.
4. The equipment presents a potential electrostatic charging hazard. See instructions.
5. The fastening screws shall be stainless steel socket head cap screws of property class A2-70 and yield stress 450 MPa
6. Repairs of the flameproof joints must be made in accordance with structural specifications provided by the manufacturer. Repairs must not be made on the basis of the values in IEC 60079-1.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

1. Time duration corrected to 15min instead of 5min and Oil make corrected to DTE 10 EXCEL 68 instead of DTE 10 ECEL 68.
2. Specific condition of safe use, point 6 added as per DNV 20 ATEX 61565X, Issue 1.
3. Electrical data is updated with frequency tolerance of +/-5%.
4. Alternate O-ring material FluoroSilicone Rubber (FVMQ) is included in the product description.
5. Routine test updated for different ambient temperature range -50°C to +70°C & -20°C to +70°C.

Annex:

[Annex to certificate IECEx PRE 20.0046X Issue 3_1.pdf](#)

Annex to certificate: IECEx PRE 20.0046X Issue 3

Ambient Temperature Range

The equipment is suitable for use within an ambient temperature range of $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$ and $-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$ on the basis of elastomeric material and oil used in the construction of the equipment as below table:

#Relation between O-ring material and ambient temperature range

Ambient range	Elastomeric material	Cementing material
$-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$	Nitrile rubber (NBR-NT70, COT -40°C to $+100^{\circ}\text{C}$) & Fluorocarbon rubber (Viton-VT70, COT -30°C to $+220^{\circ}\text{C}$)	RTV Silicon compound anabond grade 666. (COT -50°C to $+250^{\circ}\text{C}$)
$-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$	FluoroSilicone Rubber (FVMQ- FSL 70, COT -70°C to $+220^{\circ}\text{C}$)	

#Relation between Hydraulic Oil and ambient temperature range

Sr. No.	Oil	Make / Model	Pour Point	Flash point	Viscosity	Ambient range
1	DTE 10 EXCEL 68	Mobil	ASTM D97 - -38°C	CLEVELAND OPEN CUP, ASTM D92- 240°C	KINEMATIC VISCOSITY @ 40°C , ASTM D445- 68.4 MM^2/S	$-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
2	QUINTOLUBRIC 888-46	Quaker Houghton	ASTM D97 - -30°C	CLEVELAND OPEN CUP, ASTM D92- 300°C	KINEMATIC VISCOSITY @ 40°C - 47.5 MM^2/S	
3	AEROSHELL FLUID 4	SHELL	$< -60^{\circ}\text{C}$	FLASHPOINT (PENSKY MARTIN CLOSED CUP)- 105°C	KINEMATIC VISCOSITY @ -56°C - 2300 - 3000 MM^2/S	$-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
4	UNIVIS HVI 13	Mobil	ASTM D97 - -60°C	CLEVELAND OPEN CUP, DIN EN ISO 2592- $>100^{\circ}\text{C}$	KINEMATIC VISCOSITY @ -40°C , ASTM D445- 371 MM^2/S	
5	SCH 626	Mobil	ASTM D97 - -54°C	CLEVELAND OPEN CUP, ASTM D92- 225°C	KINEMATIC VISCOSITY @ 40°C , ASTM D445- 68 MM^2/S	

Electrical Data

EHF series self-contained electro-hydraulic actuator mainly can be provided with following types of motors:

Electrical rating of Motors:

Motors are manufactured in different rating as shown in table below with three phase and single phase electrical supply. The three phase motors are rated up to 480 VAC, 50/60Hz and single phase motors are rated up to 240 VAC 50/60 Hz with supply variation no more than +/- 10% on voltage and +/- 5% on frequency.

For DC supply voltage, the motors are rated up to 48VDC supply.

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Motor Description	Phases	Frequency (Hz)	Stator Length (mm)	Speed (RPM)	Power (kW-15min)	Power (kW-Continuous)	Gross Volume (L)
Motor 1	3	50	75	3000	0.50	0.25	1.87
Motor 2	3	60	75	3600	0.50	0.25	1.87
Motor 3	3	60	75	3600	0.60	0.30	1.87
Motor 4	1	50	90	3000	0.40	0.20	2.24
Motor 5	1	60	90	3600	0.40	0.20	2.24
Motor 6	1	50	90	3000	0.40	0.20	2.24
Motor 7	1	50	90	3000	0.40	0.20	2.24
Motor 8	1	60	90	3600	0.40	0.20	2.24
Motor 9	3	50	85	3000	1.50	0.75	2.12
Motor 10	3	60	85	3600	1.25	0.63	2.12
Motor 11	3	50	85	3000	1.50	0.75	2.12
Motor 12	3	60	85	3600	1.25	0.63	2.12
Motor 13	3	60	90	3600	0.90	0.45	2.24
Motor 14	3	50	75	1500	0.50	0.25	1.87
Motor 15	3	60	75	1800	0.50	0.25	1.87
Motor 16	3	60	75	1800	0.60	0.30	1.87
Motor 17	1	50	90	1500	0.20	0.10	2.24
Motor 18	1	50	90	1500	0.30	0.15	2.24
Motor 19	1	60	90	1800	0.20	0.10	2.24
Motor 20	1	60	90	1800	0.20	0.10	2.24
Motor 21	1	50	40	1500	0.10	0.05	1.00
Motor 22	1	50	40	1500	0.20	0.10	1.00
Motor 23	3	50	65	1500	0.40	0.20	1.62
Motor 24	3	60	90	1800	0.90	0.45	2.24
Motor 25	3	50	85	1500	0.90	0.45	2.12
Motor 26	1	50	90	1500	0.40	0.20	2.24
Motor 27	1	60	90	1800	0.30	0.15	2.24
Motor 28	1	60	90	1800	0.30	0.15	2.24
Motor 29	1	60	90	1800	0.30	0.15	2.24
Motor 30	1	50	100	1500	0.30	0.15	2.49
Motor 31	1	60	100	1800	0.30	0.15	2.49
Motor 32	3	50	85	1500	0.70	0.35	2.12
Motor 33	3	50	75	3000	0.50	0.25	1.87
Motor 34	3	50	75	750	0.10	0.05	1.87
Motor 35	3	50	75	1500	0.50	0.25	1.87
Motor 36	3	60	85	3600	1.25	0.63	2.12
Motor 37	3	60	85	1800	0.90	0.45	2.12
Motor 38	3	50	85	3000	1.50	0.75	2.12
Motor 39	3	50	85	1500	0.90	0.45	2.12

Motor 40	3	50	75	1500	0.50	0.25	1.87
Motor 41	3	60	75	1800	0.50	0.25	1.87
Motor 42	3	50	40	1500	0.10	0.05	1.00
Motor 43	3	50	40	1500	0.10	0.05	1.00
Motor 44	1	60	40	1800	0.10	0.05	1.00
Motor 45	1	60	40	1800	0.10	0.05	1.00
Motor 46	3	50	90	1500	0.40	0.20	2.24
Motor 47	3	50	85	1500	0.80	0.40	2.12
Motor 48	3	50	85	1500	0.90	0.45	2.12
Motor 49	3	50	75	1000	0.20	0.10	1.87
Motor 50	3	60	75	1200	0.20	0.10	1.87
Motor 51	3	50	75	750	0.10	0.05	1.87
Motor 52	3	60	75	900	0.10	0.05	1.87
Motor 53	1	50	75	750	0.10	0.05	1.87
Motor 54	1	50	75	750	0.10	0.05	1.87
Motor 55	1	60	90	3600	0.40	0.20	2.24
Motor 56	1	50	75	750	0.10	0.05	1.87
Motor 57	1	50	40	1500	0.10	0.05	1.00
Motor 58	1	50	100	1500	0.30	0.15	2.49
Motor 59	3	50	40	3000	0.40	0.20	1.00
Motor 60	3	50	62	3000	0.50	0.25	1.55
Motor 61	3	60	40	3600	0.30	0.15	1.00
Motor 62	3	50	40	3000	0.40	0.20	1.00
Motor 63	3	60	40	3600	0.40	0.20	1.00
Motor 64	3	50	62	3000	0.50	0.25	1.55
Motor 65	3	60	62	3600	0.50	0.25	1.55
Motor 66	3	60	62	3600	0.60	0.30	1.55
Motor 67	3	50	85	3000	1.50	0.75	2.12
Motor 68	3	60	85	3600	1.25	0.63	2.12
Motor 69	3	50	125	3000	2.50	1.25	3.12
Motor 70	3	60	125	3600	3.00	1.50	3.12
Motor 71	3	50	85	1500	0.80	0.40	2.12
Motor 72	3	50	85	3000	1.50	0.75	2.12
Motor 73	3	60	85	3600	1.25	0.63	2.12
Motor 74	3	50	85	1500	0.70	0.35	2.12
Motor 75	3	50	40	1500	0.20	0.10	1.00
Motor 76	3	50	62	1500	0.40	0.20	1.55
Motor 77	3	50	90	1500	0.80	0.40	2.24
Motor 78	3	50	40	1500	0.20	0.10	1.00
Motor 79	3	60	40	1800	0.20	0.10	1.00
Motor 80	3	60	62	1800	0.30	0.15	1.55
Motor 81	3	50	62	1500	0.40	0.20	1.55
Motor 82	3	60	62	1800	0.40	0.20	1.55

Motor 83	3	60	90	1800	0.60	0.30	2.24
Motor 84	3	50	90	1500	0.80	0.40	2.24
Motor 85	3	60	85	1800	1.00	0.50	2.12
Motor 86	3	50	125	1500	2.00	1.00	3.12
Motor 87	3	60	85	1800	1.00	0.50	2.12
Motor 88	3	60	85	3600	1.25	0.63	2.12
Motor 89	3	60	85	1800	0.90	0.45	2.12
Motor 90	1	50	40	3000	0.50	0.25	1.00
Motor 91	1	50	125	3000	3.00	1.50	3.12
Motor 92	1	50	40	1500	0.10	0.05	1.00
Motor 93	1	50	40	1500	0.30	0.15	1.00
Motor 94	1	50	90	1500	0.70	0.35	2.24
Motor 95	3	60	40	1800	0.10	0.05	1.00
Motor 96	1	50	90	1500	0.70	0.35	2.24
Motor 97	1	50	40	1500	0.30	0.15	1.00
Motor 98	1	50	125	3000	3.00	1.50	3.12
Motor 99	1	50	40	3000	0.50	0.25	1.00
Motor 100	3	60	125	1800	1.50	0.75	3.12
Motor 101	3	50	125	1500	2.00	1.00	3.12
Motor 102	3	50	125	3000	2.50	1.25	3.12
Motor 103	1	50	40	1500	0.10	0.05	1.00
Motor 104	1	60	40	3600	0.50	0.25	1.00
Motor 105	1	60	125	3600	3.00	1.50	3.12
Motor 106	1	60	40	1800	0.10	0.05	1.00
Motor 107	1	60	40	1800	0.30	0.15	1.00
Motor 108	1	60	90	1800	0.70	0.35	2.24
Motor 109	0	NA	85	3000	3.10	1.55	4.23
Motor 110	0	NA	85	1500	0.90	0.45	4.23
Motor 111	0	NA	85	3000	2.92	1.46	4.23
Motor 112	3	50	145	1500	4.40	2.20	6.30
Motor 113	0	NA	125	1500	0.27	0.14	4.23
Motor 114	0	NA	125	1500	0.54	0.27	4.23
Motor 115	0	NA	125	1500	1.10	0.55	4.23