Фиксаторы SITEMA серии KFHR

Технические характеристики

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Астана (7172)727-132
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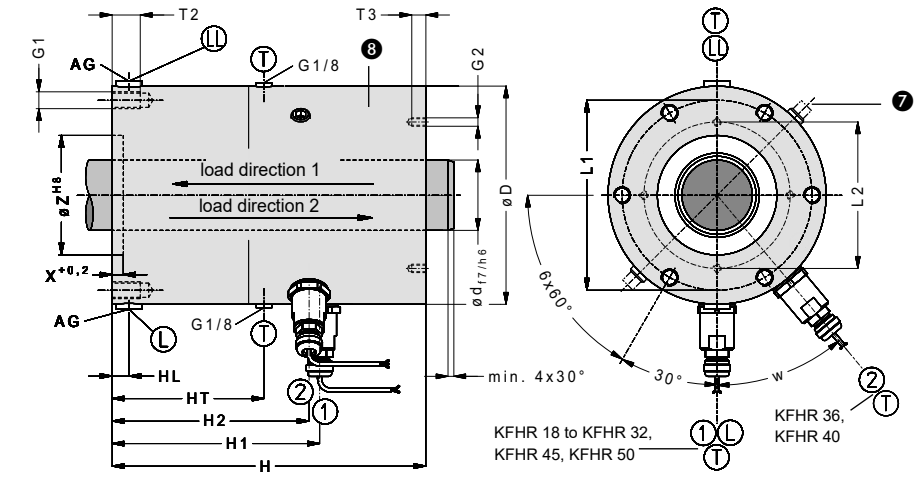
www.sitema.nt-rt.ru || sqm@nt-rt.ru

Technical Data Sheet TI-F53
Locking Units series KFHR Sealed for humid conditions

For a detailed functional description refer to *"Technical Information TI-F10"*.
Further important practical advice is given in *"Operating Manual BA-F53"*.

Rod diameter 18 mm – 50 mm



Ⓛ Pressure port L "release" see ❷
Ⓛⓛ Pressure port LL alternative to L see ❸
Ⓣ Ports T "pressure compensation / oil filling" see ❻
① Holder with proximity switch 1, signal "rod clamped" see ❺
② Holder with proximity switch 2, signal "clamping released" see ❺

Due to tolerances, ports 1, 2 and T can be displaced up to +/-5° relative to drawn position as well as the threaded holes G2 to pressure ports L/LL and ports T.

Fig. 1: Dimensions Locking Unit KFHR

			❶	❷												❹						
Type	**ID no.**	**d**	**F**	**p**	**D**	**H**	**L1**	**L2**	**T2**	**T3**	**G1**	**G2**	**Z**	**X**	**AG**	**V**	**HL**	**H1**	**H2**	**HT**	**w**	**Wgt**
	(order no.)	*mm*	*kN*	*bar*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*			*mm*	*mm*		*cm³*	*mm*	*mm*	*mm*	*mm*		*kg*
KFHR 18	KFHR 018 70	18	10	70	71	137	60	34	12	8	6xM6	4xM4	30	4	G1/8	6	29	105	98	68	45°	4
	KFHR 018 71		5	40																		
KFHR 25	KFHR 025 70	25	20	100	95	140	82	44	15	10	6xM8	4xM6	50	6	G1/8	11	19	89.5	83	62	35°	7
	KFHR 025 71		12	50																		
KFHR 28	KFHR 028 70	28	34	100	115	178	96	63	18	10	6xM10	4xM6	60	6	G1/4	18	20	118	112	94	30°	12
	KFHR 028 71		20	50																		
KFHR 32	KFHR 032 70	32	34	100																		
	KFHR 032 71		20	50																		

Subject to modification without prior notice

❶ The nominal holding force F is the minimum holding force for dry or hydraulic-oil wetted rods.

❷ The pressure p is required to release the clamping. The admissible operating pressure is 160 bar.

❸ As supplied, pressure port LL is plugged by a plug screw. It may be used alternatively to pressure port L and is useful for filling / air-bleeding. We recommend connecting auto-bleeders to the ports which are not in use (see *"Technical Information TI-Z10"*).

❹ Hydraulic operating volume

❺ The Locking Unit KFHR is fitted with inductive proximity switches (M8 x 1, nominal switching distance of 1.2 mm, flush mountable, NO (normally open)). The proximity switches are pressure-resistant up to 10 bar and have a cast-on cable of 5 m length.

❻ Internal volume changes during switching are compensated at ports T.
For use in a humid environment, the Locking Unit KFHR is to be filled or flushed with hydraulic oil for protection against corrosion. One of the ports T is used for filling and plugged or permanently connected to an oil circuit.
The other port T needs to be connected permanently to the tank with a pressureless line. A certain back pressure caused by height differences between tank and unit is admissible (up to approx. 1 bar). Higher pressure at ports T is not allowed, as it may lead to malfunction, damage of the proximity switches or to leakage.

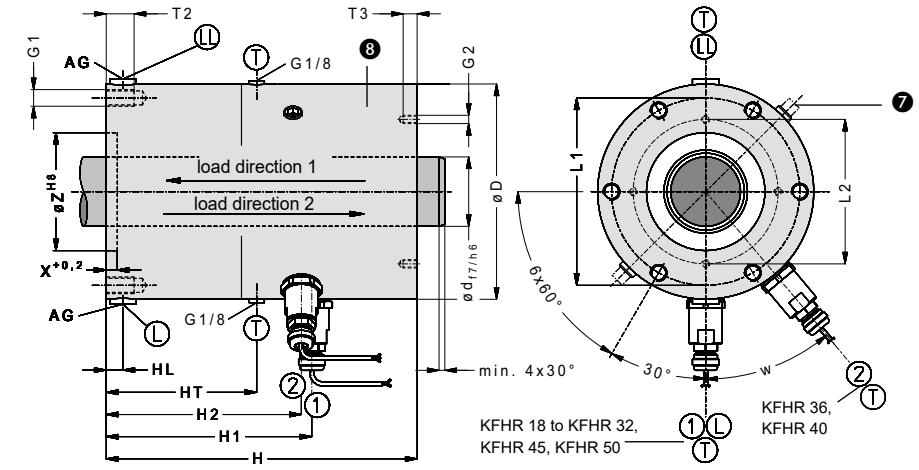
❼ Lock plates keep the Locking Unit KFHR released and need to be removed after installation.

❽ The surface of the housing parts is ZnNi coated.

Technical Data Sheet TI-F53
Locking Units series KFHR Sealed for humid conditions

For a detailed functional description refer to *"Technical Information TI-F10"*.
Further important practical advice is given in *"Operating Manual BA-F53"*.

Rod diameter 18 mm – 50 mm



Ⓛ Pressure port L "release" see ❷
Ⓛⓛ Pressure port LL alternative to L see ❸
Ⓣ Ports T "pressure compensation / oil filling" see ❻
① Holder with proximity switch 1, signal "rod clamped" see ❺
② Holder with proximity switch 2, signal "clamping released" see ❺

Due to tolerances, ports 1, 2 and T can be displaced up to +/-5° relative to drawn position as well as the threaded holes G2 to pressure ports L/LL and ports T.

Fig. 2: Dimensions Locking Unit KFHR

			❶	❷												❹					
Type	**ID no.**	**d**	**F**	**p**	**D**	**H**	**L1**	**L2**	**T2**	**T3**	**G1**	**G2**	**Z**	**X**	**AG**	**V**	**HL**	**H1**	**H2**	**HT**	**w**	**Wgt**
	(order no.)	*mm*	*kN*	*bar*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*			*mm*	*mm*		*cm³*	*mm*	*mm*	*mm*	*mm*		*kg*
KFHR 36	KFHR 036 70	36	50	100	138	200	115	80	18	14	6xM10	4xM6	70	6	G1/4	28	19	109.5	119	96	30°	20
	KFHR 036 71		35	55																		
KFHR 40	KFHR 040 70	40	50	100																		
	KFHR 040 71		35	55																		
KFHR 45	KFHR 045 70	45	75	100	155	223	135	96	20	14	6xM12	4xM6	85	8	G1/4	39	20	147.5	140	108	30°	27
	KFHR 045 71		45	75																		
KFHR 50	KFHR 050 70	50	75	100																		
	KFHR 050 71		45	75																		

Subject to modification without prior notice

❶ The nominal holding force F is the minimum holding force for dry or hydraulic-oil wetted rods.

❷ The pressure p is required to release the clamping. The admissible operating pressure is 160 bar.

❸ As supplied, pressure port LL is plugged by a plug screw. It may be used alternatively to pressure port L and is useful for filling / air-bleeding. We recommend connecting auto-bleeders to the ports which are not in use (see *"Technical Information TI-Z10"*).

❹ Hydraulic operating volume

❺ The Locking Unit KFHR is fitted with inductive proximity switches (M8 x 1, nominal switching distance of 1.2 mm, flush mountable, NO (normally open)). The proximity switches are pressure-resistant up to 10 bar and have a cast-on cable of 5 m length.

❻ Internal volume changes during switching are compensated at ports T.
For use in a humid environment, the Locking Unit KFHR is to be filled or flushed with hydraulic oil for protection against corrosion. One of the ports T is used for filling and plugged or permanently connected to an oil circuit.
The other port T needs to be connected permanently to the tank with a pressureless line. A certain back pressure caused by height differences between tank and unit is admissible (up to approx. 1 bar). Higher pressure at ports T is not allowed, as it may lead to malfunction, damage of the proximity switches or to leakage.

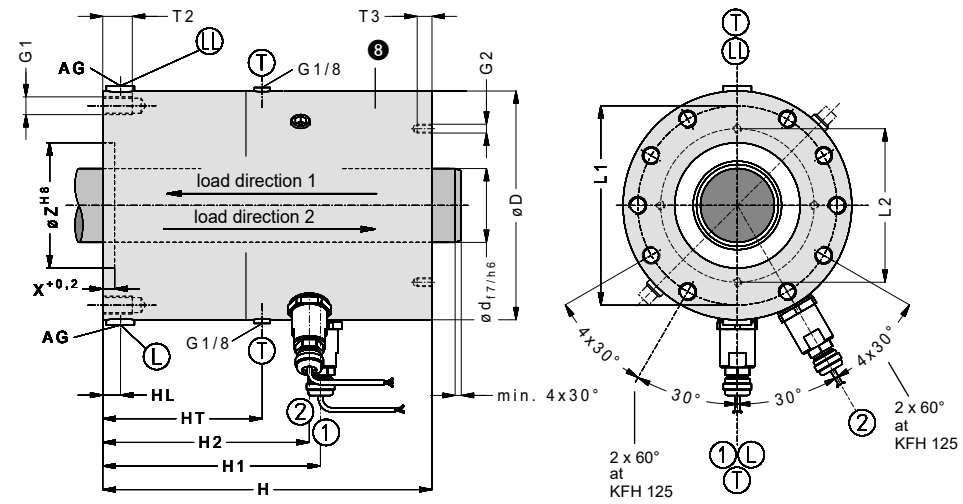
❼ Lock plates keep the Locking Unit KFHR released and need to be removed after installation.

❽ The surface of the housing parts is ZnNi coated.

Technical Data Sheet TI-F53
Locking Units series KFHR Sealed for humid conditions

For a detailed functional description refer to *"Technical Information TI-F10"*.
Further important practical advice is given in *"Operating Manual BA-F53"*.

Rod diameter 56 mm – 60 mm



Ⓛ Pressure port L "release" see ❷
Ⓛⓛ Pressure port LL alternative to L see ❸
Ⓣ Ports T "pressure compensation / oil filling" see ❻
① Holder with proximity switch 1, signal "rod clamped" see ❺
② Holder with proximity switch 2, signal "clamping released" see ❺

Due to tolerances, ports 1, 2 and T can be displaced up to +/-5° relative to drawn position as well as the threaded holes G2 to pressure ports L/LL and ports T.

Fig. 3: Dimensions Locking Unit KFHR

			❶	❷												❹					
Type	**ID no.**	**d**	**F**	**p**	**D**	**H**	**L1**	**L2**	**T2**	**T3**	**G1**	**G2**	**Z**	**X**	**AG**	**V**	**HL**	**H1**	**H2**	**HT**	**Wgt**
	(order no.)	*mm*	*kN*	*bar*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*			*mm*	*mm*		*cm³*	*mm*	*mm*	*mm*	*mm*	*kg*
KFHR 56	KFHR 056 70	56	100	100	180	252	160	172	20	13	10xM12	4xM6	95	10	G1/4	47	22	151.5	144	105	41
	KFHR 056 71		70	70																	
KFHR 60	KFHR 060 70	60	100	100																	
	KFHR 060 71		70	70																	

Subject to modification without prior notice

❶ The nominal holding force F is the minimum holding force for dry or hydraulic-oil wetted rods.

❷ The pressure p is required to release the clamping. The admissible operating pressure is 160 bar.

❸ As supplied, pressure port LL is plugged by a plug screw. It may be used alternatively to pressure port L and is useful for filling / air-bleeding. We recommend connecting auto-bleeders to the ports which are not in use (see *"Technical Information TI-Z10"*).

❹ Hydraulic operating volume

❺ The Locking Unit KFHR is fitted with inductive proximity switches (M8 x 1, nominal switching distance of 1.2 mm, flush mountable, NO (normally open)). The proximity switches are pressure-resistant up to 10 bar and have a cast-on cable of 5 m length.

❻ Internal volume changes during switching are compensated at ports T.
For use in a humid environment, the Locking Unit KFHR is to be filled or flushed with hydraulic oil for protection against corrosion. One of the ports T is used for filling and plugged or permanently connected to an oil circuit.
The other port T needs to be connected permanently to the tank with a pressureless line. A certain back pressure caused by height differences between tank and unit is admissible (up to approx. 1 bar). Higher pressure at ports T is not allowed, as it may lead to malfunction, damage of the proximity switches or to leakage.

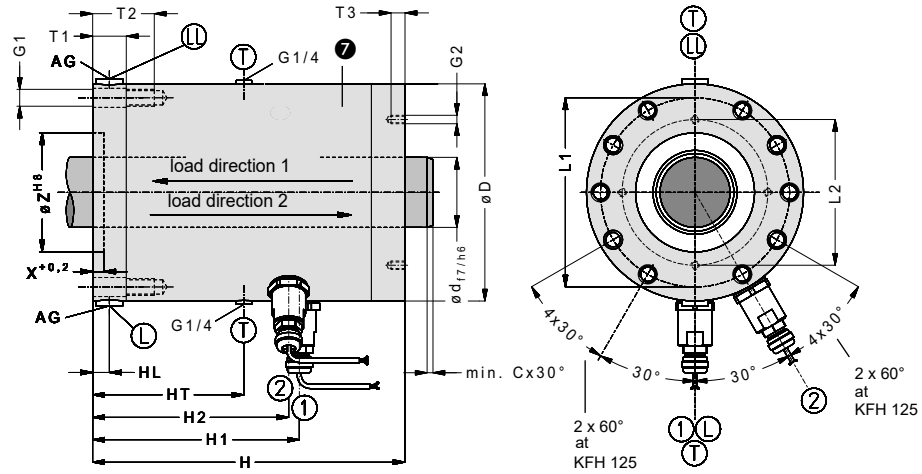
❼ Lock plates keep the Locking Unit KFHR released and need to be removed after installation.

❽ The surface of the housing parts is ZnNi coated.

Technical Data Sheet TI-F53
Locking Units series KFHR Sealed for humid conditions

For a detailed functional description refer to *"Technical Information TI-F10"*.
Further important practical advice is given in *"Operating Manual BA-F54"*.

Rod diameter 70 mm – 140 mm



Ⓛ Pressure port L "release" see ❷
Ⓛⓛ Pressure port LL alternative to L see ❸
Ⓣ Ports T "pressure compensation / oil filling" see ❻
① Holder with proximity switch 1, signal "rod clamped" see ❺
② Holder with proximity switch 2, signal "clamping released" see ❺

Due to tolerances, ports 1, 2 and T can be displaced up to +/-5° relative to drawn position.

Fig. 4: Dimensions Locking Unit KFHR

				❶	❷												❹					
Type	**ID no.**	**d**	**C**	**F**	**p**	**D**	**H**	**L1**	**L2**	**T1**	**T2**	**T3**	**G1**	**G2**	**Z**	**X**	**AG**	**V**	**HL**	**H1**	**H2**	**HT**	**Wgt**
	(order no.)	*mm*	*mm*	*kN*	*bar*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*			*mm*	*mm*		*cm³*	*mm*	*mm*	*mm*	*mm*	*kg*
KFHR 70	KFHR 070 70	70	4	150	100	225	315	195	160	26	56	16	10xM16	4xM8	110	10	G1/4	68	13	192	185	236	82
	KFHR 070 71			80	60																		
KFHR 80	KFHR 080 70	80	4	150	100																		
	KFHR 080 71			80	60																		
KFHR 90	KFHR 090 70	90	5	250	130	260	393	225	175	30	65	20	10xM20	4xM10	125	10	G3/8	95	15	221	214	283	129
	KFHR 090 71			190	100																		
KFHR 100	KFHR 100 70	100	5	250	130																		
	KFHR 100 71			190	100																		
KFHR 125	KFHR 125 70	125	5	330	100	350	416	300	250	40	90	20	6xM30	4xM12	230	10	G3/8	230	24	244.5	235	336	240
KFHR 140	KFHR 140 70	140	5	600	100	430	514	370	385	50	95	30	10xM30	4xM16	170	10	G3/8	330	30	346.5	334	437	447

Subject to modification without prior notice

❶ The nominal holding force F is the minimum holding force for dry or hydraulic-oil wetted rods.

❷ The pressure p is required to release the clamping. The admissible operating pressure is 160 bar.

❸ As supplied, pressure port LL is plugged by a plug screw. It may be used alternatively to pressure port L and is useful for filling / air-bleeding. We recommend connecting auto-bleeders to the ports which are not in use (see *"Technical Information TI-Z10"*).

❹ Hydraulic operating volume

❺ The Locking Unit KFHR is fitted with inductive proximity switches (M8 x 1, nominal switching distance of 1.2 mm, flush mountable, NO (normally open)). The proximity switches are pressure-resistant up to 10 bar and have a cast-on cable of 5 m length.

❻ Internal volume changes during switching are compensated at ports T.

For use in a humid environment, the Locking Unit KFHR is to be filled or flushed with hydraulic oil for protection against corrosion. One of the ports T is used for filling and plugged or permanently connected to an oil circuit.

The other port T needs to be connected permanently to the tank with a pressureless line. A certain back pressure caused by height differences between tank and unit is admissible (up to approx. 1 bar). Higher pressure at ports T is not allowed, as it may lead to malfunction, damage of the proximity switches or to leakage.

❼ The surface of the housing parts is ZnNi coated.

Purpose

The Locking Unit KFHR clamps a rod in any position. It is especially used on cylinder rods or other round rods which are used in **humid conditions**.

Axial play

The load is held free from axial play in load direction 1.

In standard designs, the load is also free from axial play in load direction 2 as long as the load does not exceed 80 % of the nominal holding force (F). In the case of exceeding, the axial play in load direction 2 is about 0.1 - 0.3 mm.

Operating conditions

The Locking Unit KFHR is **sealed** to be used in humid conditions.

With appropriate piping of the ports T and oil filling or flushing of the Locking Unit KFHR, operation in humid conditions is made possible. In case of heavy soiling conditions or extreme temperatures, please contact SITEMA.

The permitted surface temperature is -20°C to +60°C.

Viscous lubricants and grease may reduce the holding force.

Required risk assessment

It must be ensured that the dimensions and arrangement of a Locking Unit KFHR used in safety-relevant applications meet the requirements of the risk evaluation EN ISO 12100:2010 and also comply with any further standards and regulations applicable for the intended use. The Locking Unit KFHR alone principally cannot form a complete safety solution. It is however suitable to be part of such a solution. Furthermore, all attachments and fixations have to be dimensioned correspondingly. This is generally the duty of the system manufacturer and the user.

Choosing the right type

The table shows the nominal holding force F of the various types. The value of F must be higher than the maximum axial load acting on the rod.

In case vertically moving masses shall be held or stopped or in case other dynamic impact forces occur, an appropriate safety factor must be applied. This factor has to be defined by the user depending on the requirements, but should not be less than 1.5.

Pressure fluid

Hydraulic oil (HLP) in accordance with DIN 51524-2:2017 must be used as pressure fluid. Please consult SITEMA before using any other fluids.

Design and attachment of the rod

The Locking Unit KFHR will operate correctly only if the rod has a suitable surface:

- ISO tolerance field f7 or h6
- induction hardened min. HRC 56, surface hardening depth:
  ø up to 30 mm: min. 1 mm
  ø over 30 mm: min. 1.5 mm
- surface roughness: Rz = 1 to 4 µm (Ra 0.15 - 0.3 µm)
- protection against corrosion, e.g. hard chromium plating: 20 ±10 µm, 800 – 1 000 HV
- lead-in chamfer, rounded:
  ø 18 mm up to ø 80 mm: min. 4 x 30 °
  ø over 80 mm up to ø 180 mm: min. 5 x 30 °
  ø over 180 mm up to ø 380 mm: min. 7 x 30 °

Often, the following standard rods fulfill the above mentioned requirements and can then be used:

- piston rods (ISO tolerance field f7), hard chrome plated
- rods for linear ball bearings (ISO tolerance field h6)

The rod must not be lubricated with grease.

The actual holding force of the Locking Unit KFHR is higher than the **nominal holding force (F)** indicated in the data sheets and drawings but will not be higher than twice this value. Therefore, all **fixation elements** carrying the load (rod, its attachment, etc.) have to be dimensioned for at least **2 x F**. Please note that at dynamic loads, the full holding force (2 x F) can occur.

In case of overload, the rod will slip. This does normally not cause any damage to the rod or the clamping unit.

Generally, the basic rod material needs to have sufficient yield strength. In the case of compression-loaded rods, sufficient buckling resistance must be assured.

Mounting information KFHR 18 to KFHR 60

As supplied, the Locking Unit KFHR (rod diameter 18 mm to 60 mm) is blocked in its released state and can be slid over and fixed to the clamping rod easily. After mounting, the transportation spacers must be removed. Please refer to the operating manual for further information.

Control

In most applications, an actuation as suggested in the drawing below is used.

During every operational cycle, the 3/2-way valve is actuated electrically and releases the Locking Unit KFHR. In all other operational conditions including power failure, emergency stop etc., the Locking Unit KFHR engages and holds the rod or brakes the load. Likewise, the load is secured when the pressure line breaks.

To prevent possible problems, the rod shall not be driven unless proximity switch 2 indicates the signal “clamping released”.

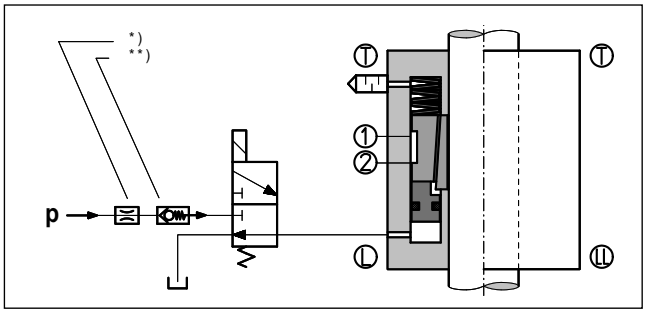


Fig. 5: Schematic diagram of hydraulic circuit

* In case impact noises due to excess pressure are audible when pressurizing the Locking Unit KFHR, these can be suppressed by means of a flow control valve in the p-line.

** In case the pressure is not sufficiently constant (e.g. pressure drop at the beginning of a downward stroke), we recommend a check valve in the p-connection of the valve.

⚠ WARNING!
Risk due to slowed discharge of pressure medium!
Slowed discharge of the pressure medium may cause a dangerous situation. The clamping then only locks with a time delay.

- Make sure that the discharge of the pressure medium from pressure port L is **not** impaired by any additional components.
- Route all connection lines without any kinks.
- If there is any danger of kinking, take appropriate precautions (protective tube, thicker hose, etc.).

If a particular quick response time of the Locking Unit KFHR is required, the following preconditions must be met:

- short line distances
- fast valve response times
- appropriate control
- large valve and line cross-sections

Regular performance tests

The Locking Unit KFHR must be functionally checked at regular intervals. Regular checking is the only way to ensure that the Locking Unit KFHR will operate safely in the long run.

Please see the *operating manual* for further details.

Maintenance

The maintenance is limited to the regular performance tests.

Should the SITEMA Locking Units KFHR cease to comply with the required characteristics, the safety for working with the machine or system may no longer be given. In this case the SITEMA Locking Units KFHR must be immediately and professionally repaired by SITEMA.

The SITEMA Locking Units KFHR are safety components. Any repair or refurbishing must be carried out by SITEMA. SITEMA cannot take any responsibility for repairs by another party.

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Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93