

Operating Instructions

Original in compliance with 2006/42/EG

Sling Chain Assemblies

Grades 8 and 10/XL

Manufacturer:

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THIELE



1 Description and Intended Use

THIELE round link chains and attachment components form part of sling chain assemblies and are conducive to the safe transportation of loads.

These Operating Instructions describe in particular how round short-link chains according to TWN 0805 grade 8 and TWN 1805 grade 10/XL (TWN = THIELE Shop Standard) are safely used for hoisting purposes. The instructions apply analogously to components of identical design.

THIELE chain sling assemblies of the following design configurations are available:

- assembled with clevis-type hook system,
- assembled with connecting links,
- assembled with clevis-type hook system and connecting links,
- as welded sling chain assembly.

THIELE sling chain assemblies meet EG Machinery Directive 2006/42/EG requirements and feature a safety factor of at least 4 based on Working Load Limit (WLL).

THIELE chain sling assemblies are provided with tags showing the CE symbol.

Chain sling assemblies and pertinent components are marked with nominal chain size and quality grade data, manufacturer's symbol (e.g. BG stamp H4) and identification number.

THIELE sling chain assemblies and attachment elements are designed to withstand 20,000 dynamic load changes under maximum load conditions. In the event of higher loads (e.g. multi-shift/automatic operation, magnetic spreaders) the WLL must be reduced.

Sling chain assemblies shall be composed of round link chains and components of identical nominal chain size and quality grade. In case of deviating configurations the pertinent documentation (Declaration of Conformity, Operating Instructions etc.) has to be suitably modified.

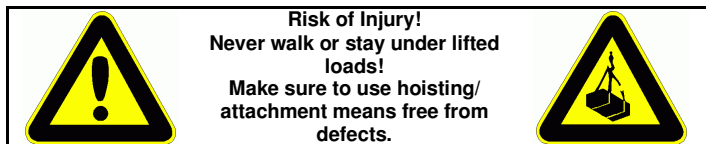
Round link chains to TWN 0805 and TWN 1805 as well as the related attachment components and connecting links are intended for use as sling chain assemblies as per DIN EN 818-4 for the purpose of attachment and hoisting of loads.

Sling chain assemblies must exclusively be used

- if mass and center of gravity of the load are known or have been professionally estimated,
- within the limits of their permissible Working Load Limit,
- for permissible attachment methods and inclination angles,
- within the temperature limits prescribed,
- with suitable connecting links, attachment components or shortening elements,
- by trained and authorized persons.

Chain slings must not be employed for lashing duty or as hoist chains.

2 Safety Notes



- Operators, fitters, and maintenance personnel must in particular observe the Operating Instructions, documentations DGUV V 1, DGUV R 100-500 Chapter 2.8, DGUV R 109-004, DGUV V 52, DGUV I 209-013 and DGUV I 209-021 issued by the German Employers' Liability Insurance Association, as well as standard specifications DIN 685-5, PAS 1061, DIN EN 818-1, DIN EN 818-2, DIN EN 818-4, DIN EN 818-6.
 - In the Federal Republic of Germany, the Operational Safety Ordinance (BetrSichV) has to be implemented and the Technical Rule for Industrial Safety TRBS 1201, in particular Annex 1, Chapter 2 "Special regulations for the use of working equipment for lifting loads" must be observed. #
 - Outside the Federal Republic of Germany the specific provisions issued locally in the country where the items are used must also be observed.
 - The directions given in these Operating Instructions and specified documentations relating to safety, assembly, operation, inspection, and maintenance must be made available to the respective persons.
- Make sure these Operating Instructions are available in a place near the product during the time the equipment is used. Please contact the manufacturer if replacements are needed. See also chapter 12. #

- When performing work make sure to wear your personal protective equipment!
- **Improper assembly and use may cause personal injury and/or damage to property.**
- Assembly and removal as well as inspection and maintenance must exclusively be carried out by skilled and authorized persons.
- Structural changes are impermissible (e.g. welding, bending).
- **Operators must carry out a visual inspection and, if necessary, a functional test of the safety equipment before each use. #**
- Never put to use worn-out, bent or damaged sling chain assemblies.
- Only lift loads the mass of which is less than or equal to the Working Load Limit of the sling chain assembly.
- Never expose chains to loads exceeding the specified Working Load Limits.
- Position the load hook above the load's center of gravity.
- Do not use force when mounting/positioning the attachment components.
- Make sure the load can take the forces to be applied without suffering deformation.
- Do not tip-load a hook.
- Do not twist or knot the chains together.
- When using shortening elements without additional safety means (e.g. TWN 0827, TWN 1827 or TWN 0851), special care must be taken and the correct position of the chain in the shortening element is to be verified for each individual hoisting operation.
- Avoid sharp edges. Use edge protectors or reduce the WLL by 20 %.
- Note that the Working Load Limits will reduce in the following cases
 - if the load is not balanced symmetrically,
 - if the chain is used in choke hitch applications,
 - when higher temperatures prevail,
 - when high dynamic and cyclic loads arise (automated or multi-shift operation),
 - when lifting magnets are employed.
- In case of multi-leg sling chain assemblies never allow for inclination angles of less than 15 ° and in excess of 60 °.
- Hooks shall have well-functioning safety latches.
- Attach unused chain legs to the suspension link.
- Suspension links must be allowed to move freely in the crane hook.
- Only lift loads that are freely movable and not attached or fastened.
- Avoid bending loads to act on chain links and components.
- Safety elements must not be excessively stressed or strained operationally.
- Make sure to use shortening/grab hooks or claws for chain shortening purposes.
- In case of shortening claws only put loads on the chain exiting the claw pocket bottom.
- Safeguard sling chain assemblies to prevent slipping when using the basket hitch application method.
- Do not start lifting before you have made sure the load has been correctly attached.
- Make sure no one including you (operator) is in the way of the moving load (hazard area).
- During lifting/hoisting make sure your hands or other body parts do not come into contact with hoisting means. Only remove hoisting means manually (use your hands).
- Avoid impacts, e.g. due to abruptly lifting loads with chain in slack condition.
- Never move a suspended load over persons.
- Never cause suspended loads to swing.
- Always monitor a suspended load.
- Put the load only down in flat places/sites where it can be safely deposited.
- Avoid parts of the sling chain assembly to get caught under the load.
- Take care for sufficient place for the personnel to move when choosing the route of transportation and storage location. Danger to life and risk of injury by crushing hazards!
- In the event of doubts about the use, inspection, maintenance or similar things contact your safety officer or the manufacturer.

THIELE will not be responsible for damage caused through non-observance of the instructions, rules, standards and notes indicated!

As regards quality grade 10/XL THIELE does not give its general approval to the assembly of components stemming from different manufacturers!

As a rule, chain slings are not permitted for the transportation of persons.

When used in applications as ENDLESS CHAIN duly observe the relevant separate operating manual!

Working under the influence of drugs or alcohol is strictly forbidden!

3 Commissioning

Prior to using the components for the first time make sure that

- the components comply with the order and have not been damaged,
- test certificate, statement of compliance, and Operating Instructions are at hand,
- markings correspond with what is specified in the documentation,
- inspection deadlines and the qualified persons for examinations are determined,[#]
- visibility and functional testing are carried out and documented,[#]
- the documentation is safely kept in an orderly manner.

Dispose of the packing in an environmentally compatible way according to local rules.

4 Technical Data

Working Load Limit Table – Quality Grade 8 [t]

Size	1-leg 0 °	2-leg		3-/4-leg	
		0 ° - 45 °	45 ° - 60 °	0 ° - 45 °	45 ° - 60 °
6-8	1,12	1,6	1,12	2,36	1,7
7-8	1,5	2,12	1,5	3,15	2,24
8-8	2,0	2,8	2,0	4,25	3,0
10-8	3,15	4,25	3,15	6,7	4,75
13-8	5,3	7,5	5,3	11,2	8,0
16-8	8,0	11,2	8,0	17	11,8
18-8	10	14	10	21,2	15
20-8	12,5	17	12,5	26,5	19
22-8	15	21,2	15	31,5	22,4
26-8	21,2	30	21,2	45	31,5
28-8 ¹⁾	25	33,5	25	50	37,5
32-8	31,5	45	31,5	67	47,5
36-8 ¹⁾	40	56	40	85	60
40-8 ¹⁾	50	71	50	106	75
45-8 ¹⁾	63	90	63	132	95
50-8 ¹⁾	80	112	80	160	118
56-8 ¹⁾	100	140	100	200	150

Working Load Limit Table – Quality Grade 10/XL [t]

Size	1-leg 0 °	2-leg		3-/4-leg	
		0 ° - 45 °	45 ° - 60 °	0 ° - 45 °	45 ° - 60 °
6-10/XL	1,4	2,0	1,4	3,0	2,1
8-10/XL	2,5	3,55	2,5	5,3	3,8
10-10/XL	4,0	5,6	4,0	8,5	6,0
13-10/XL	6,7	9,0	6,7	14	10
16-10/XL	10	14	10	21,2	15
18-10/XL ¹⁾	12,5	17,5	12,5	26,5	18,5
20-10/XL ¹⁾	16	22,4	16	33,5	23,6
22-10/XL ¹⁾	19	26,5	19	40	28
26-10/XL ¹⁾	26,5	37,5	26,5	56	40
32-10/XL ¹⁾	40	56	40	85	60

¹⁾ welded

Article Numbers - Round Link Chains – Grade 8 to TWN 0805:

Size	Working Load Limit WLL [t]	Article No.			Mass [kg/m]
		nsw	RAL 9005	corrothiel	
6-8	1,12	F01452	F01453	F01454	0,8
7-8	1,5	F01458	F01459	F01457	1,1
8-8	2,0	F01464	F01465	F01429	1,4
10-8	3,15	F01469	F01470	F01450	2,2
13-8	5,3	F01474	F01475	F01476	3,8
16-8	8,0	F01479	F01480	F01487	5,7
18-8	10	F01484	F01485	F04580	7,3
20-8	12,5	F01494	F01495	F04606	9,0
22-8	15,0	F01499	F01500	F04629	10,9
26-8	21,2	F01514	F01515	F04695	15,2
28-8 ¹⁾	25,0	F01519	F01520	F01521	17,6
32-8	31,5	F01524	F01525	F01526	23
36-8	40	F01529	F01530	F04814	29
40-8 ¹⁾	50	F01534	F01535	F04838	36
45-8 ¹⁾	63	F01539	F01540	F04889	46
50-8 ¹⁾	80	F01545	F01546	F04900	56
56-8 ¹⁾	100	F01555	F01556	F04908	73
63-8 ¹⁾	125	---	F01566	---	89
71-8 ¹⁾	160	---	F01576	---	110

Article Numbers - Round Link Chains – Grade 10/XL to TWN 1805:

Size	Working Load Limit WLL [t]	Article No. RAL 5002	Mass [kg/m]
6-10/XL	1,4	F01610B	0,8
8-10/XL	2,5	F01615B	1,5
10-10/XL	4,0	F01622B	2,3
13-10/XL	6,7	F01629B	3,9
16-10/XL	10	F01635B	5,8
18-10/XL ¹⁾	12,5	F01641B	7,4
20-10/XL ¹⁾	16	F01638B	9,0
22-10/XL ¹⁾	19	F01650B	11,0
26-10/XL ¹⁾	26,5	F01660B	15,0
32-10/XL ¹⁾	40	F01670B	23,0

¹⁾ welded

5 Assembly and Removal

5.1 Preparations

Make sure all components to be installed are in perfect condition and the relevant Working Load Limits of all parts suit the respective load to be handled.

5.2 Chain Assembly/Removal

When assembling or disassembling sling chain assemblies the relevant assembly and Operating Instructions issued for the components are to be observed.

5.3 Clevis-type Hook System

The fixed-size clevis-type hook system only permits attachment of the nominal chain size that suits the attachment component.

Assembly

If necessary, remove dowel pin and pin.

- Place end of chain leg between the lateral clevis elements.
- Push pin from the side fully into the clevis and through the last chain link of the leg.
- Drive dowel pin fully in (must not project) to secure the pin. The slot must face away from the pin.

Check whether the chain runs smoothly.

Only connect pins and attachment components of identical quality grades (starting with Ø 13 mm the pins are marked on the front end).

The dowel pins must only be installed once.

Disassembly

Slacken the respective chain leg.

- Drive dowel pin out using hammer and drift punch 2).
- Push pin out using a drift punch.
- Remove the chain.

²⁾ Suitable drift punches are available by Article No. Z03303.

**Article Numbers for Spares Sets (Pins and Dowel Pins)
Clevis-type Hook System – Quality Grade 8**

Size	Article No. Spares Set	e.g for clevis-type hook systems of the components according to:	
6-8	F48694	TWN 0810/1 -/2 -/4	Master links
8-8	F48352	TWN 0811/1 -/2 -/4	Master links
		TWN 0812	Ring shackles
10-8	F48355	TWN 0820	Oblong master links
		TWN 0827 -/1	Shortening hooks
13-8	F48358	TWN 0835 -/1	Sling hooks
		TWN 0848/1	Skip loader eyelets
16-8	F48361	TWN 0851	Shortening claws
		TWN 0859	Foundry hooks
18-8	F48364	TWN 0861	Special clevis shackles
20-8	F48369	TWN 0862	Clevis shackles
		TWN 0869	Skip loader eyelets
22-8	F48367	TWN 0889	Motor transporting hooks
		TWN 0896	Shortening units
26-8	F48373	TWN 1450	Screw tensioners
		TWN 1451	Screw tensioners
32-8	F48371	TWN 1452	Screw tensioners

Article Numbers for Spares Sets (Pins and Dowel Pins) Clevis-type Hook System of Quality Grade 10/XL

Size	Article No. Spares Set	e.g for clevis-type hook systems of the components according to:	
6-10/XL	F48686	TWN 1810/1 -/2 -/4	Master links
8-10/XL	F48687	TWN 1811/1 -/2 -/4	Master links
		TWN 1812	Ring shackles
10-10/XL	F48688	TWN 1835 -/1	Sling hooks
		TWN 1851	Shortening claws
13-10/XL	F48689	TWN 1896	Shortening units
		TWN 1454	Screw tensioners
16-10/XL	F48690	TWN 1455	Screw tensioners

Article Numbers for Tags

Quality grade 8, TWN 0940	without ring	F08040
	with ring	F08042
Quality grade 10/XL, TWN 1940	without ring	F08052
	with ring	F08053

6 Conditions of Use

6.1 Normal Use

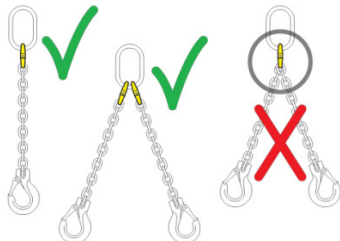
When 4-leg sling chain assemblies are used there is basically a danger that the load will act on two oppositely located chain legs only. In such a case check the Working Load Limit of the sling chain assembly and, if expedient, use an assembly that has a higher WLL.

Shortening individual chain legs is indicative of a non-symmetrical load distribution. In this case, attention is to be paid to WLL reductions.

If choke hitch applications are involved the Working Load Limit is to be additionally reduced by 20 %.

When using hooks without safety latch, e.g. due to operational necessities, special care is to be taken, and a separate risk analysis should be prepared.

When attaching components observe correct position of the connecting link.
Relevant forces must act in longitudinal direction.



If two chain legs are arranged in one connecting link half for alternate use of the legs, only one chain leg must be subjected to loads!

If not all chain legs in a multi-leg sling chain assembly are put to use, the Working Load Limit is to be reduced according to the following table:

Number of sling chain assembly legs	Number of legs to be put to use	Use factor relevant to WLL specified
2	1	1/2
3 or 4	2	2/3
3 or 4	1	1/3

6.2 Influence of Temperature

The respective temperature range limits have to be taken into account for all components used.

Using sling chain assemblies at elevated temperatures will cause the Working Load Limit to be reduced as indicated below.

Quality grade	Temperature range	Remaining WLL
8	-40 °C ≤ 200 °C	100 %
	200 °C ≤ 300 °C	90 %
	300 °C ≤ 400 °C	75 %
10/XL	-30 °C ≤ 200 °C	100 %
	200 °C ≤ 300 °C	90 %
	300 °C ≤ 380 °C	60 %

When the chains are to be used within other temperature ranges please get in touch with the manufacturer.

If the sling chain assemblies have been exposed to temperatures exceeding the maximum values specified they must no longer be used.

6.3 Environmental Influence

Sling chain assemblies must not be used in environments where acids, aggressive or corrosive chemicals or their fumes are present.
Hot-dip galvanizing or a galvanic treatment is prohibited as well.

6.4 Especially Hazardous Conditions

The degree of danger when used in offshore applications, the lifting of persons or hazardous loads, such as for example liquid metal, or similar risk potentials have to be assessed by a competent person in the form of a risk analysis. Any additional rules and directives must be followed in this case.

For applications in abrasive blasting environments very short inspection intervals have to be scheduled. Selecting a welded sling chain assembly of the next greater nominal size will increase the available wear allowance.

7 General Notes on Attachment Components

7.1 Connecting Links

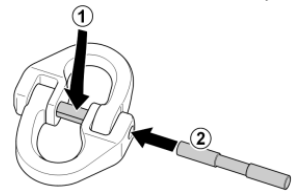
In mounted sling chain assemblies the chains are, for example, joined to other components by means of connecting links. In this way, components can be mounted the nominal size of which deviates from that of the chain.

Sizes and quality grades of chain and connecting link must always coincide!

Assembly

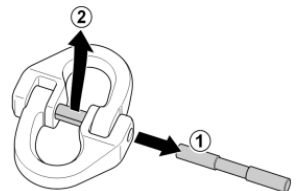
Install the connecting link halves in the components to be connected and join both halves.

- 1.Position split sleeve as shown.
- 2.Push pin up to the split sleeve, align pin bevels to suit split sleeve and drive the pin in using a hammer.
- 3.Check to make sure split sleeve safely embraces the pin centrally.



Disassembly

- 1.Use drift to drive pin out.
- 2.Remove the split sleeve.
- 3.Separate connecting link halves from the components they joined.



A set of drifts to TWN 0945 is available by Article No. Z03303.

The split sleeves must only be installed once.

Make sure the components to be connected can move freely within the connecting link half they are placed in.

7.2 Shortening Elements

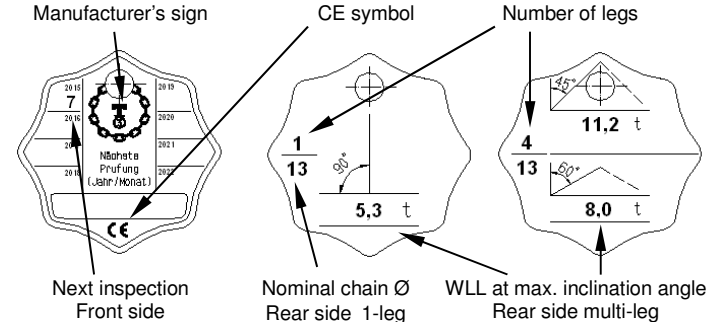
When using shortening elements, such as for example shortening hooks or claws as well as quick-action combination shorteners, please follow the respective separate operating and/or assembly instructions.

8 Identification/Marking

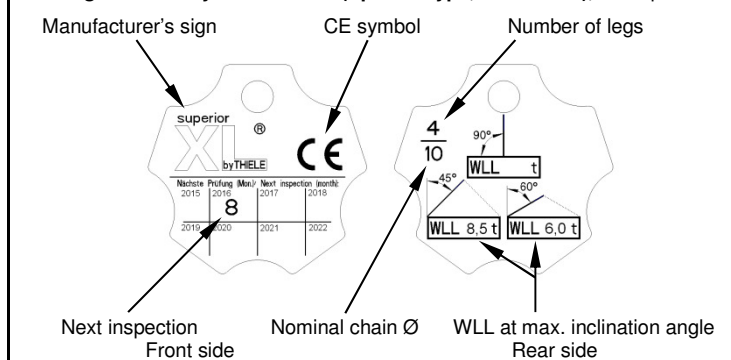
As a rule, an identification tag as prescribed in EN 818-4 is attached to the sling chain assembly adjacent to the master link.

8.1 Tags for Quality Grade 8, Example

Form and color (red) of the tags correspond to requirements set forth in DIN EN 818-4.



8.2 Tags for Quality Grade 10/XL (Special Type, Blue Color), Example:



9 Inspections, Maintenance, Disposal

Inspections and maintenance must be arranged for by the Owner!

Inspection deadlines shall be determined by the Owner!

Inspections must be carried out and documented by competent persons regularly but at least once a year, or more frequently if the chain slings are in heavy-duty service. After three years at the latest they must additionally be examined for cracks. A load test shall never be considered a substitute for this examination.

The results of the inspection shall be entered into a register (DGUV I 209-062 or DGUV I 209-063) to be prepared when the sling chain assembly is first used. The register will show characteristic data of the chains and components as well as identity details.

Immediately stop using sling chain assemblies that show the following defects:

- missing or illegible identification/markings,
- deformation, elongation or fractures of chains or components,
- cuts, notches, cracks, incipient cracks, pinching,
- links heated beyond permissible limits,
- severe corrosion,
- pitch elongation of individual chain links by more than 5 % each,
- reduction of the averaged link thickness by more than 10 % as mean value of measurements taken perpendicularly towards each other,
- impaired or missing safety systems, for example if the hook safety latch is defect,
- widening of the hook by more than 10 % or if the safe seating of the hook safety latch is no longer ensured,
- limited hinging capability (halves get stuck),
- wear in excess of 10 %, e.g. in the receiving area of the connecting link halves or of the pin diameter,
- missing or damaged pin locks or removal preventing guards.

Cleaning (e.g. prior to inspections) must not take place by using flames or methods that might cause hydrogen embrittlement (e.g. pickling or immersion in acidic solutions).

The following chain gauges are available for use during inspections:

Chain gauges for quality grade 8:	Art. No. F48856
Chain gauge, Size 6-10/XL:	Art. No. F01690
Chain gauge, Size 8-10/XL:	Art. No. F01691
Chain gauge, Size 10-10/XL:	Art. No. F01692
Chain gauge, Size 13-10/XL:	Art. No. F01693
Chain gauge, Size 16-10/XL:	Art. No. F01694

Inspection Service

THIELE offers inspection, maintenance and repair services by trained and competent personnel.

Maintenance and Repair

Maintenance and repair work must only be performed by competent persons. Do not repair individual links but instead replace complete chain legs only.

If the safety latch of hooks does not longer engage properly with the tip of the hook chances are that not only the hook but also at least the chain leg might have been overloaded. In all such cases replace all items used in the respective leg (chain, shortening element, ring shackle etc.).

Minor notches and cracks may be eliminated by careful grinding observing the maximum cross section reduction requirement of 10 % and avoid making more severe cuts or scores.

Welded sling chain assemblies must exclusively repaired by the manufacturer. All maintenance and repair activities are to be documented.

Disposal

All components and accessories of steel taken out of service are to be scrapped in line with local regulations and provisions.

10 Spare Parts

Also see Chapter 4, Technical Data.

Only use original spare parts.

Detailed information on spares can be found in separate component assembly instructions available for THIELE products via www.thiele.de or upon request.

11 Storage

Make sure sling chain assemblies are stored properly sorted, suspended and in dry locations at temperatures ranging between 0 °C and +40 °C.

12 THIELE Operating and Mounting Instructions

Current operating and installation instructions are available as a PDF download on the homepage.



13 Publishing Information

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'#' Changes to previous edition.

EC Declaration of Conformity

acc. to Machinery Directive 2006/42/EG, Annex II A for a machine

THIELE GmbH & Co. KG herewith declares as manufacturer that

Sling chain assemblies of quality grades 8 and 10/XL

are placed on the market in the form of a complete machine by THIELE together with the relevant test certificate, and are in compliance with the applicable provisions of the EU Machinery Directive 2006/42/EG.

The following harmonized standards have been observed:

- DIN EN ISO 12100
- DIN EN 818, Parts 1, 2, 4 and 6
- DIN EN 1677, Parts 1 to 4

Other standards and specifications have also been observed as follows:

- PAS 1061
- DIN 685-5
- DIN 5688-3

This declaration/statement is not meant to warrant any product properties. Safety notes and instructions pertinent to the products must be observed.

Responsible for the documentation:
Dr. Jürgen Obenaus
(Head of QA and EP)
Tel.: +49(0)2371/947-541

Iserlohn, 17 March 2016
Dr. Günther Philipp
(Managing Director)

Note:

If sling chain assemblies are manufactured of individual components by other persons/companies or if major modifications/changes are made these persons/companies are deemed to be the manufacturer within the meaning of the EU Machinery Directive and they are responsible for the preparation of the documentation (e.g. Declaration of Conformity, Operating Instructions/DIN etc.).