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Tension wheel assemblies

Sicat 8WL5070, 8WL5071 and 8WL5078 for overhead contact line

The tension wheel assemblies of the product lines Sicat® 8WL5070, 8WL5071 and 8WL5078 serve for automatic flexible tensioning of contact or catenary wire in overhead contact line systems in mass transit and main line railways.

They are part of tension wheel equipments and maintain the contact wire or catenary wire at a given constant tensile force, irrespective of variations in the wire lengths.

Features

- Low life cycle cost due to maintenance-free bush bearing and use of corrosion resistant materials
- High endurance due to symmetric groove guided wire run and therefore uniform load on both wire drums
- Flexible applicable due to diversity of variants
- Possible minimization of subsequent damage in case of break in contact wire or catenary wire due to patent-protected design of latching device of the tension wheel assembly

Technical data

Maximum tensioning force 8WL5078- / 8WL5070, 8WL5071-	[kN]	24 / 40
Minimum failing load 8WL5078 / 8WL5070, 8WL5071	[kN]	72 / 120
Mechanical advantage reduction ratio		1:3 / 1:1.5
Efficiency		≥0.97
Perm. length variation of tensioned contact wires and catenary wires		
– at mech. advantage reduction ratio 1:3	[m]	1.5
– at mech. advantage reduction ratio 1:1.5	[m]	2.3
Weight	[kg]	28...33.5
Ambient temperature	[°C]	-40...+48

Materials

Tension wheel	cast aluminium alloy
Suspension, swing lever, hoop	hot-dip galvanized steel, stainless steel
Latching plate	aluminium
Standard parts	stainless steel

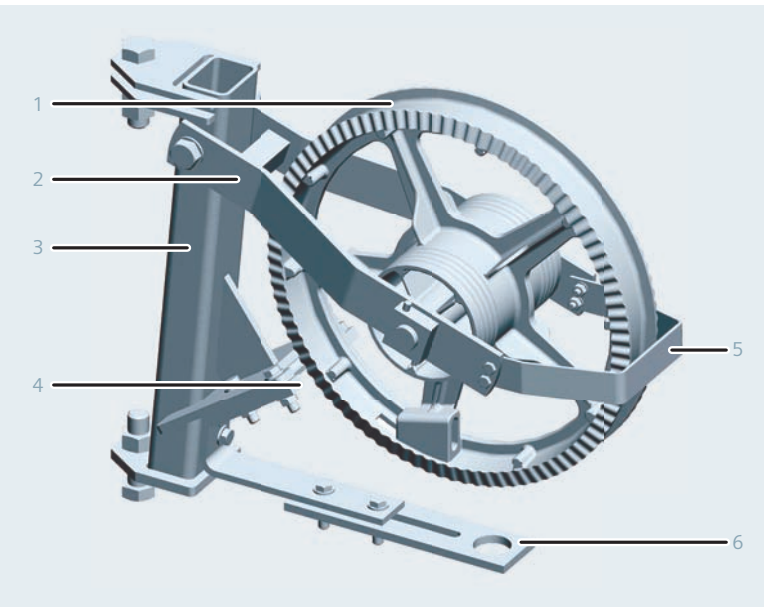
Option

May be equipped with catenary monitoring system Sicat CMS

Design

The tension wheel assembly consists of the following main components:

- Tension wheel
- Swing lever
- Suspension
- Latching plate
- Safety hoop (only for variants with wire guide distant from pole)
- Bracket for guide tube (depending on type)



- | | |
|-----------------|--------------------------|
| 1 Tension wheel | 4 Latching plate |
| 2 Swing lever | 5 Safety hoop |
| 3 Suspension | 6 Bracket for guide tube |

Design of tension wheel assembly (schematic, without wires)

Latching device

The aluminum latching plate and the two rippled rims of the tension wheel can enable reliable locking. The trapezoidal form of the latching plate and tension wheel provide additional forced guidance and virtually symmetrical loading. As a result, functional reliability is very high and consequential damage to adjacent assemblies and in the installation itself can be kept to a minimum (reduced impact factor).

Low-wear wire movement

Symmetrical wire grooves on both sides of the pulley of the tension wheel ensure that, given optimal alignment of the tension wheel assembly, the wire runs onto the wheel body with minimum wear.

Arrangement possibilities

For the separate tensioning of contact wires and catenary wires the following arrangements are possible:

- parallel,
- in front of the other or
- above each other, offset.

Option Sicat CMS Catenary Monitoring System

The tension wheel assemblies can be equipped with the catenary monitoring system Sicat CMS. It continuously monitors the tensile forces in the contact wire and catenary wire.

The acquired and filtered sensor information is transmitted to the control center via the system infrastructure. The status of the overhead contact line and the location of selected damage events can be detected quickly and precisely, thereby increasing the availability of the system.

Tests and standards

The tension wheel assemblies have been tested on the in-house test facility for tension wheel assemblies and by external test institutes.

The following tests have been carried out:

- Latching test of tension wheel assembly for with tensile loads on the wire of 24 kN and 40 kN with safety factor 3 of the corresponding failing load
- Tensile force test for tension wheel and assembly suspension / swing lever
- Efficiency determination
- Impact factor measurement

according to the following standards:

- DIN EN 50119: 2002,
prEN 50119: 2008
- DIN VDE 0216: 1986

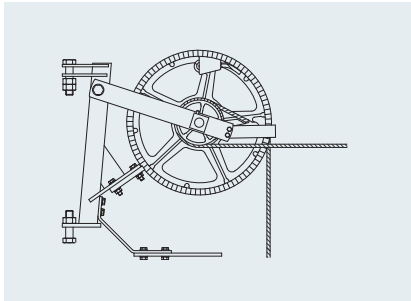
The tension wheel assemblies Sicat 8WL5070-0B and 8WL5078-0B have received approval at the DB AG.

Range of application and variants

The type selection results from the required tensioning force and operating conditions.

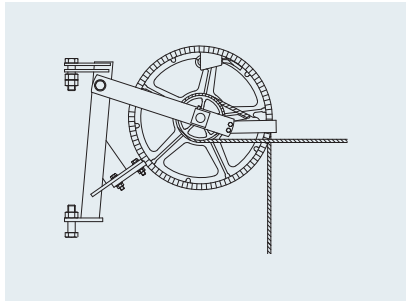
Tension wheel assemblies up to 24 kN

Sicat 8WL5078-0A/0B



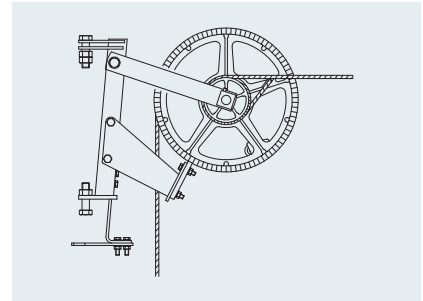
- for steel or concrete poles
- for guide tube up to $d=36$ or 43.5 mm
- mech. adv. reduction ratio 1:3

Sicat 8WL5078-0C



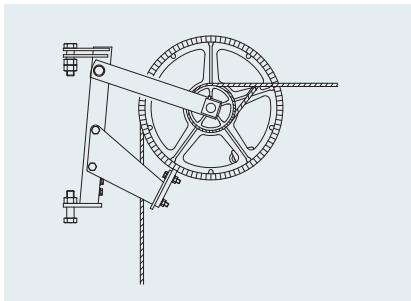
- for steel or concrete poles
- mech. adv. reduction ratio 1:3

Sicat 8WL5078-1A



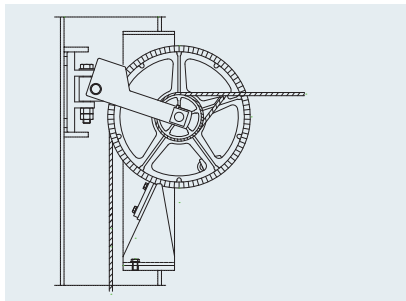
- for steel or concrete poles
- for guide tube up to $d=36$ mm
- for narrow installation conditions
- mech. adv. reduction ratio 1:3

Sicat 8WL5078-1C/1D



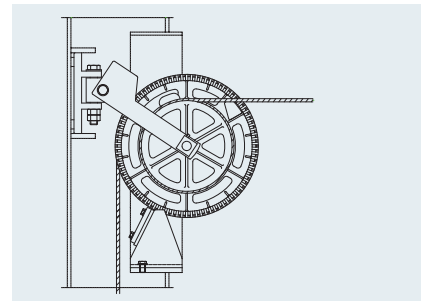
- for HE poles or structures
- for round weights up to $d=410$ mm or rectangular weights in tunnel
- mech. adv. reduction ratio 1:3

Sicat 8WL5078-2



- tension wheel assembly in steel pole
- weight guidance in pole
- mech. adv. reduction ratio 1:3

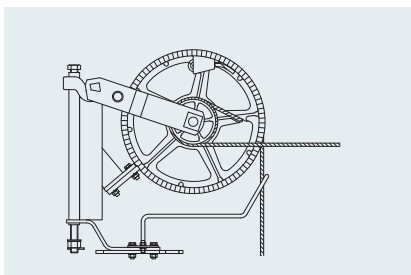
Sicat 8WL5078-3



- tension wheel assembly in steel pole
- weight guidance in pole
- mech. adv. reduction ratio 1:1.5

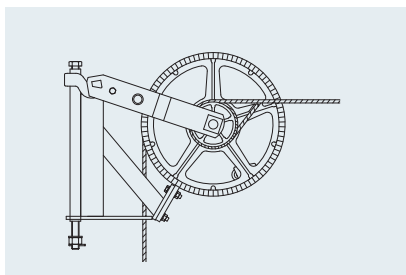
Tension wheel assemblies up to 40 kN

Sicat 8WL5070-0B



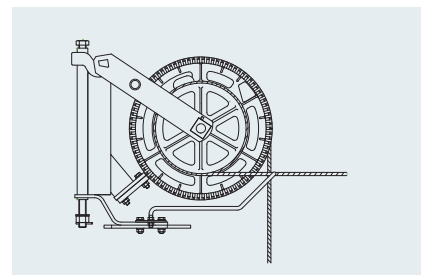
- for steel or concrete poles
- for guide tube up to $d=43.5$ mm
- mech. adv. reduction ratio 1:3

Sicat 8WL5070-1



- for HE poles or structures
- for round weights up to $d=410$ mm or rectangular weights in tunnel
- mech. adv. reduction ratio 1:3

Sicat 8WL5071-0B

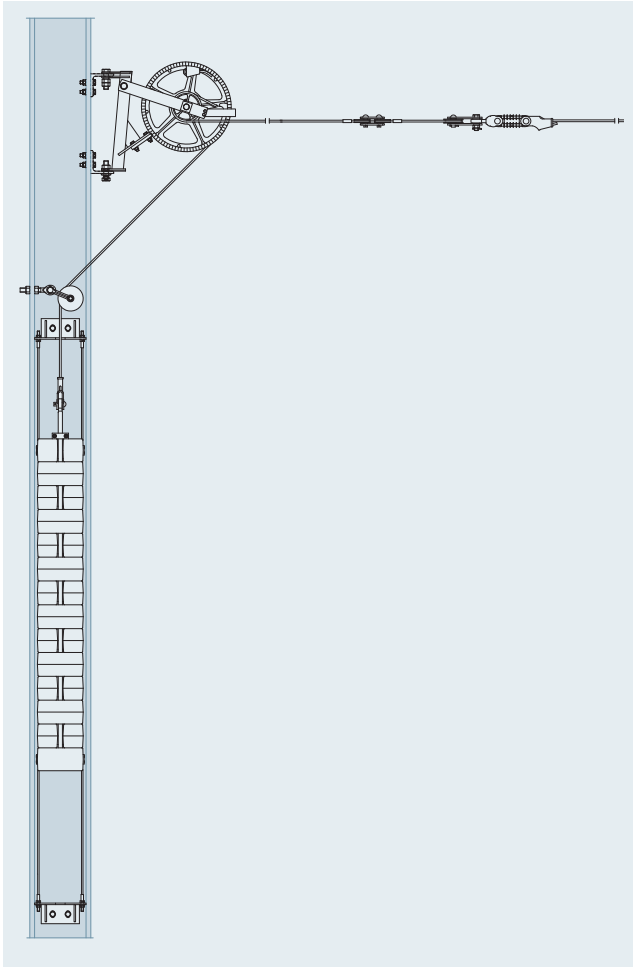


- for steel or concrete poles
- for guide tube up to $d=43.5$ mm
- mech. adv. reduction ratio 1:1.5

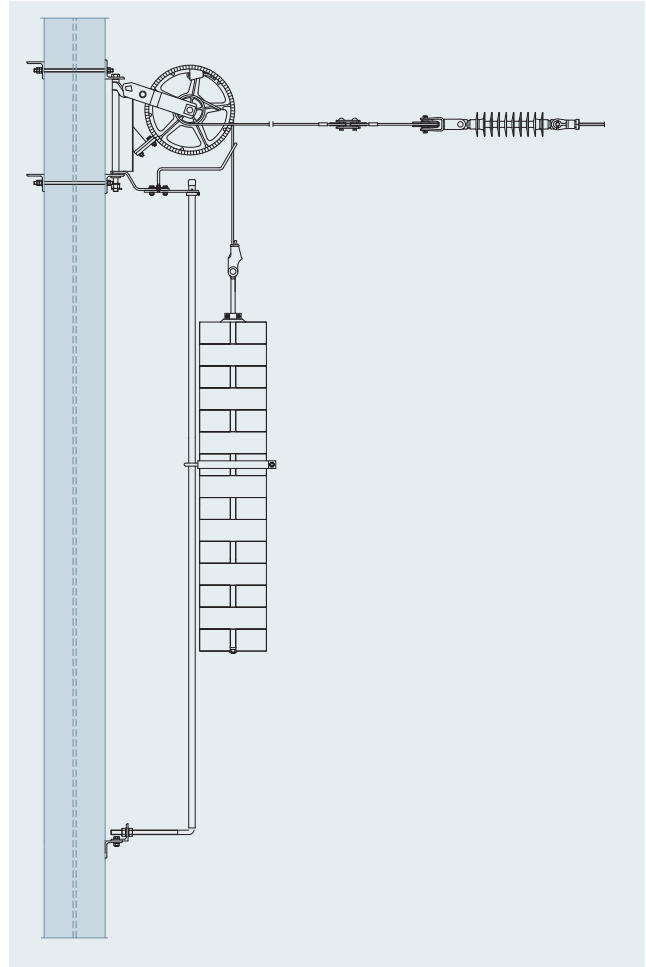
System integration

In the following you can find typical application examples for tension wheel assemblies. The exact configuration of

the complete tension wheel assembly depends on the specific plant and the local situation.



Flexible termination up to 24 kN, weight set in HE pole



Flexible termination up to 40 kN at HE pole

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. If not stated otherwise, we reserve the right to include modifications, especially regarding the stated values and dimensions.