ROSTA

Rubber Suspension Unit (as Spring Accumulator)

Type DO-A

Only type DO-A 50

DO-A 45*
R 180

$\varnothing 20^{+0.5}_{0}$ (Type DO-A 50)
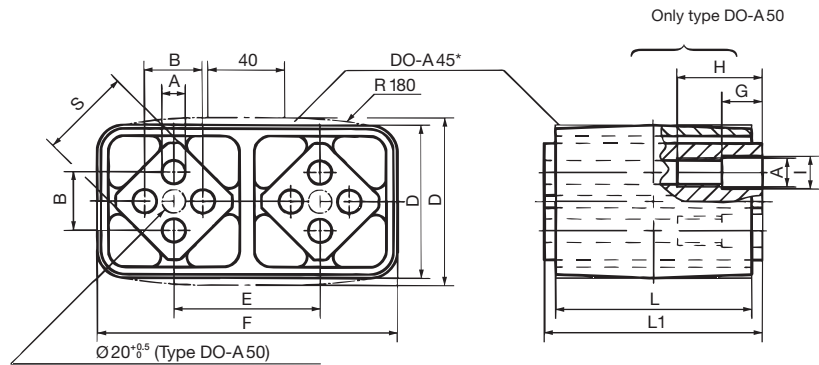
Art. No.	Type	c_d	L	$L1^{0}_{-0.3}$	A	B	D	E	F	G	H	I	S	Weight in kg
01 041 013	DO-A 45 x 80	220	80	90	$12^{+0.5}_{0}$	$35^{\pm0.5}$	85	73	$149.4^{+1.6}_{-0.4}$				45	1.85
01 041 014	DO-A 45 x 100	260	100	110	$12^{+0.5}_{0}$	$35^{\pm0.5}$	85	73	$149.4^{+1.6}_{-0.4}$				45	2.26
01 041 016	DO-A 50 x 120	400	120	130	M 12	$40^{\pm0.5}$	89	78	167	30	60	12.25	50	5.50
01 041 019	DO-A 50 x 160	500	160	170	M 12	$40^{\pm0.5}$	88	78	166	30	60	12.25	50	7.40
01 041 017	DO-A 50 x 200	600	200	210	M 12	$40^{\pm0.5}$	89	78	167	40	70	12.25	50	8.50

* DO-A 45 with convex housing shape

Material Structure

Housing of size 45 is made out of light alloy profile, housing of size 50 in nodular cast; inner squares in light alloy profile with 4 bores for the fixation of connection brackets shaker: frame.

A spring accumulator consists of two ROSTA rubber suspension units type DO-A and a customer supplied connection link **V.** The dynamic spring value of this configuration corresponds to only 50 % of a single DO-A element, due to the effected **double serie-connection,** which is reducing the dynamic stiffness to half.

Element Type	c_d	Perm. osc. angle	R	sw	n_{err}
2 x DO-A 45 x 80	110	±5°	12.5	25.0	520
		±4°	10.0	20.0	780
		±3°	7.5	15.0	1280
2 x DO-A 45 x 100	130	±5°	12.5	25.0	480
		±4°	10.0	20.0	720
		±3°	7.5	15.0	1200
2 x DO-A 50 x 120	200	±5°	13.6	27.2	420
		±4°	10.9	21.8	600
		±3°	8.2	16.4	960
2 x DO-A 50 x 160	250	±5°	13.6	27.2	400
		±4°	10.9	21.8	570
		±3°	8.2	16.4	910
2 x DO-A 50 x 200	300	±5°	13.6	27.2	380
		±4°	10.9	21.8	540
		±3°	8.2	16.4	860

trough

V

parallel

frame

c_d = dynamic spring value in N/mm
R = permissible radius in mm
sw = max. amplitude (peak to peak) in mm
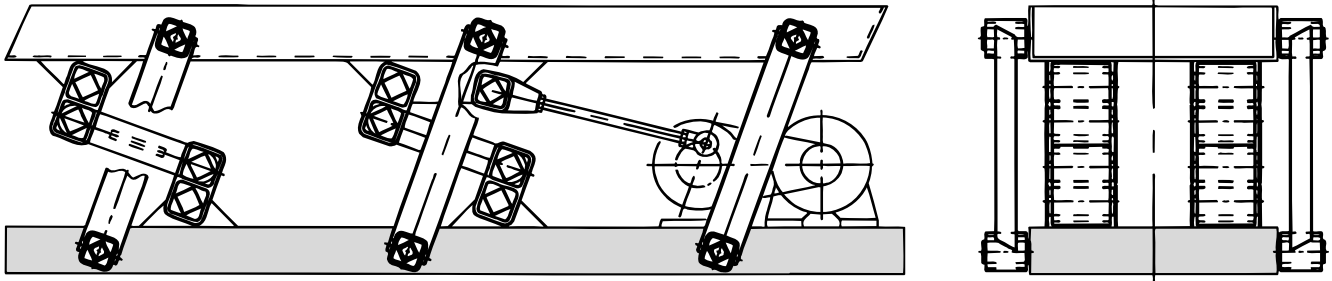n_{err} = max. frequency in min^{-1}
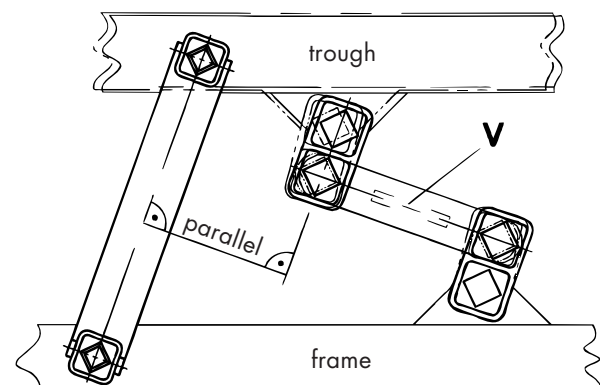
Rubber Suspension Unit Type DO-A

As Spring Accumulator for One-mass Shaker Conveyor Troughs
(Compression/Tension Spring Accumulator)

The oscillating conveyor systems are built such that they run very close to the resonance frequency in order to keep the energy consumption down and to improve the fatigue resistance of the structure (trough and frame). The total spring value c_t of the trough should be approximately equal to the stiffness of the oscillating elements. Usually the spring accumulators produce a dynamic rigidity exceeding the one of the rocker arms by far and allowing the oscillating machine to run very close to the resonance frequency in a smooth and harmonic manner.

Typical Calculation

Given:
Oscillating conveyor trough: length: 6.0 m (due to the trough stiffness there are mounted 4 rockers on each side)

Total oscillating mass	m	= 375 kg
Revolutions per minute	n_{err}	= 460 min^{-1}
Crank radius	R	= 6 mm
Oscillating machine factor	K	= 1.4

Total spring value $\quad c_t = m \cdot \left(\frac{2\pi}{60} \cdot n_{err}\right)^2 \cdot 0.001 \quad$ = 870 N/mm

Wanted:
Number of rocker suspensions for operation close to the resonance frequency

Load per rocker $G = \dfrac{m \cdot g}{z} = \dfrac{375 \cdot 9.81}{8}$ = 459.8 N

$\longrightarrow$ 8 AS-C 38 units are necessary

Spring value $c_d = 8 \cdot 19$ N/mm = 152 N/mm

4 rocker suspensions each consisting
of 2 DO-A 50 x 120 elements
with $c_d = 200$ N/mm each = 800 N/mm

Total c_d of all ROSTA rubber suspension units	= 952 N/mm
Necessary total spring value c_t of trough	= 870 N/mm
Reserve value for overload	= 82 N/mm (= 9.4%)

Suspension Units for Two-mass Oscillating Conveyor Trough

The installation of the two-mass oscillation conveyor system (see page 51) must be done according to the figure on the right.
The accumulators are mounted either on trough I and on the machine frame (see blue elements) or on the frame and on counterweight II.
When calculating the total spring value c_t of the two-mass oscillating machine it is necessary to **fully include** the counterweight.