The **Profile Damper Type TR** from the innovative ACE TUBUS series is a maintenance free, self-contained damping element made from a special Co-Polyester Elastomer. The radial deformation of the TR series provides a very long and soft deceleration with a progressive energy absorption towards the end of stroke. The excellent temperature characteristic of the material provides consistent damping performance over a temperature range of -40°C to 90°C. The low installed weight, the economic price and the long operating life of up to 1 million cycles makes this an attractive alternative to hydraulic end position damping, if the moving mass does not have to stop in an exact datum position and it is not necessary to absorb 100 % of the incoming energy.
The **space saving** package size ranges from ø 29 mm up to ø 100 mm and is very simply and quickly installed with the supplied specially stepped mounting screw.
The TR Series have been specially developed to provide **Maximum Stroke in the Minimum Mounting Space** in the capacity range from 2 Nm up to 115 Nm.

Life expectancy is extremely high; **up to twenty times** longer than for urethane dampers, up to **ten times** longer than rubber buffers and up to **five times** longer than steel springs.

Overload capacity: For emergency use only (1 cycle) it is possible to exceed the W_3 rating by +40 %.

Environment: Resistant to oil, grease, seawater and to microbe or chemical attack. Excellent UV and ozone resistance. Material does not absorb water or swell.

Dynamic force range: 300 N to 6 200 N

Temperature range: -40°C to 90°C

Energy absorption: 17 % to 35 %

Material hardness rating:
Shore 40D

Mounting: in any position

Impact velocity range:
up to max. 5 m/s

Mounting screw torque:
M5: 6 Nm
M6: 10 Nm
M8: 25 Nm

On request: special strokes, -characteristics, - spring rates, -sizes and materials.

Calculation and selection to be approved by ACE.

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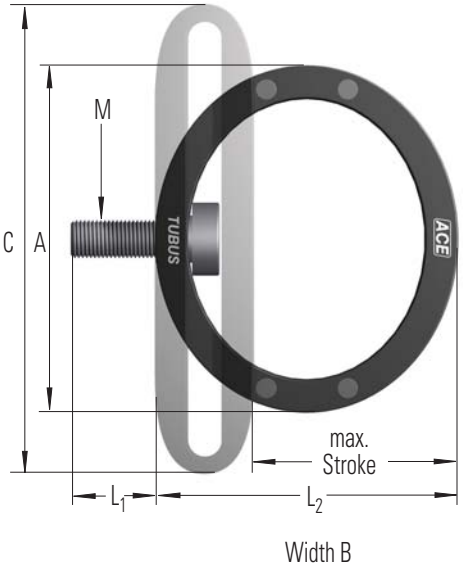
Ordering Example TR 93-57

TUBUS radial
Outer-ø 93 mm
Stroke 57 mm



The calculation and selection of the required profile damper should be carried out or be approved by ACE.

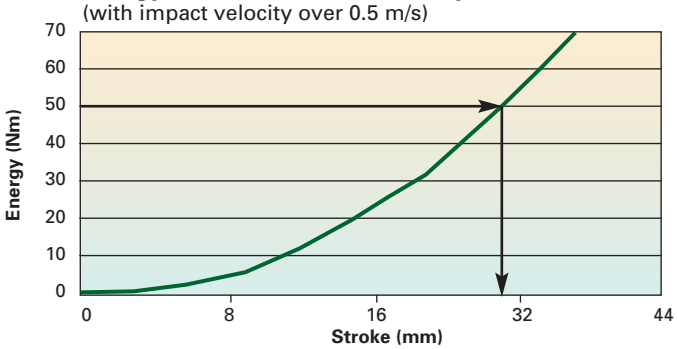
Dimensions and Capacity Chart

Type	*W_3 Nm/cycle	max. Stroke mm	A	L_1	M	L_2	B	C	Weight in gm
TR 29-17	2	17	29	5	M5	25	13	38	10
TR 37-22	3	22	37	5	M5	32	19	50	15
TR 43-25	4	25	43	5	M5	37	20	58	20
TR 50-35	6	35	50	5	M5	44	34	68	25
TR 63-43	15	43	63	5	M5	55	43	87	55
TR 67-40	25	40	67	5	M5	59	46	88	80
TR 76-46	40	46	76	6	M6	67	46	102	105
TR 83-50	45	50	83	6	M6	73	51	109	150
TR 85-50	70	50	85	8	M8	73	69	111	195
TR 93-57	90	57	93	8	M8	83	83	124	295
TR 100-60	115	60	100	8	M8	88	82	133	335

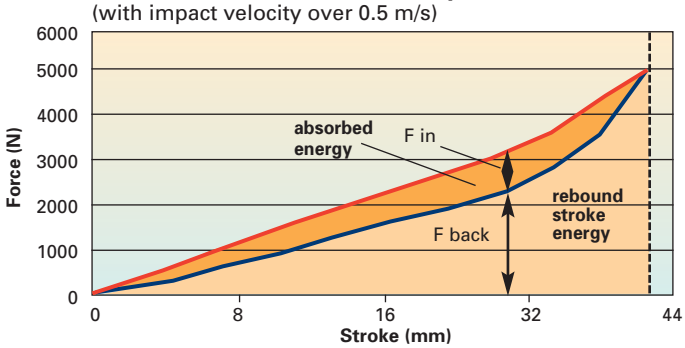
* Max. Energy capacity per cycle for continuous use. For emergency use only (1 cycle) it is possible to exceed this rating by +40 %.

Characteristics of Type TR 93-57

Energy - Stroke Characteristic (dynamic)
(with impact velocity over 0.5 m/s)



Force - Stroke Characteristic (dynamic)
(with impact velocity over 0.5 m/s)



With the aid of the characteristic curves above you can estimate the proportion of the total energy that will be absorbed. Example: With impact energy of 50 Nm the Energy-Stroke diagram shows that a stroke of about 31 mm is needed. On the Force-stroke diagram you can estimate the proportion of absorbed energy to rebound energy at this stroke length.

Dynamic (v > 0.5 m/s) and static (v ≤ 0.5 m/s) characteristics of all types are available on request.

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