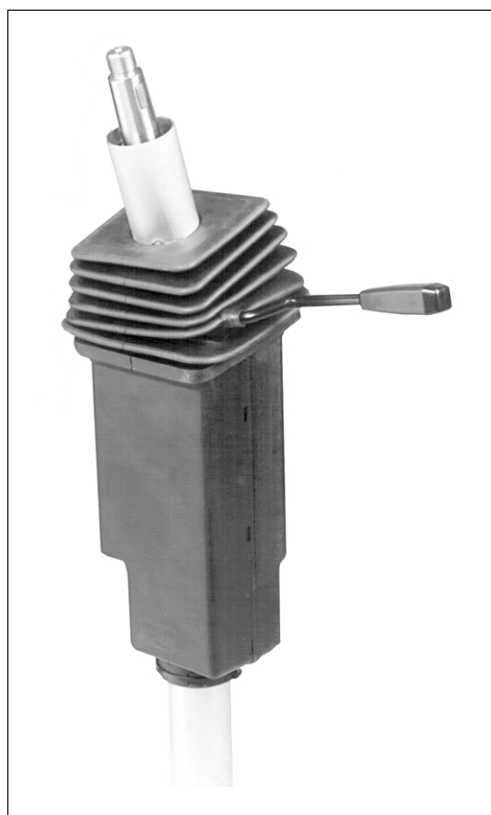


Tiltable and telescopic steering columns type OTP-TT

HN.22.F1.02 is new

Introduction



To meet market demands for more ergonomic and comfortable conditions for the drivers of vehicles with hydrostatic steering, Danfoss is introducing a range of adjustable steering columns to supplement the present range. Type OTP-TT steering columns are tiltable and telescopic.

Product program

1. Standard versions (see page 2).
2. Special versions (see page 6).
3. Customer-specific versions (see page 4)

Application and function

OTP-TT steering columns are for use with Danfoss OSPB, OSPC and OSPL steering units and torque amplifier TAD. The lower part of the column contains a telescopic section and the upper part a facility for adjusting the tilt-angle.

There is one operating handle for both functions. The telescopic length is 80 mm and adjustment is infinitely variable. The tilt can be adjusted in ten steps of 4°, i.e. a total of 40° (-16° + 24°)

By spring release the upper part tilts away from the driver.
Operating force (mean value) measured 215 mm from the fixpoint of the operating handle is 25 N for tilt adjustment and 60 N for telescopic adjustment.

Standard range installation The length of the shaft (H) end on OTP-TT standard programme steering columns is that a 4 mm intermediate plate for mounting purpose must be used between steering column and Danfoss steering unit. The intermediate plate must have four $\varnothing 12$ mm plain holes for mounting screws and $\varnothing 44.5$ centre holes. The steering column must be installed perpendicular to and centered correctly on the steering unit. (See Danfoss instruction no. HI.21.B2.52).

The tightening torque for mounting screws is max. 3 daNm. The recommended tightening torque for the steering shaft nut is 4 ± 0.5 daNm.

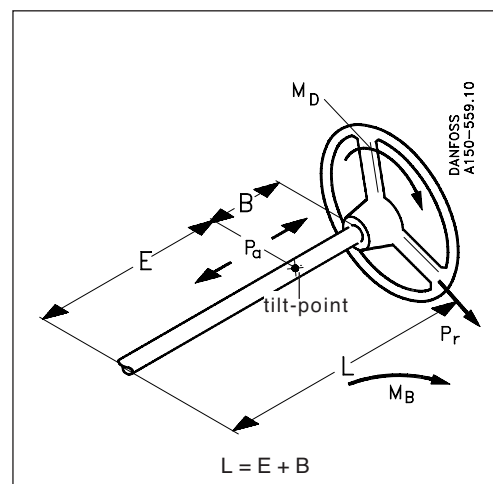
Load on steering column

Symbols:
 L (m): axial length between mounting surface and steering wheel
 P_r (daN): radial force on steering wheel
 P_a (daN): axial force on steering wheel
 M_D (daNm): turning torque
 M_B (daNm): bending moment on steering column $M_B = P_r \times L$

The steering column must be supported when E exceeds 400 mm. (B max. 134 mm). The following max. permissible values must not be exceeded:

M_D max. 24 daNm
 M_B max. 20 daNm
 P_a max. 100 daN (against end stop) *

* Telescope friction until $P_a = 70 \pm 10$ daN



Code numbers and weights, standard range

Description	Type designation	Code no. *)	Steering shaft end (A)	Length B	Length**) E	Weight kg
Tilt and telescopic adj.	OTP-TT 406	150Z0001	A1	89	317	5,4
Tilt and telescopic adj.	OTP-TT 500	150Z0003	A1	134	366	5,6
Tilt and telescopic adj.	OTP-TT 600	150Z0004	A1	134	466	5,8
Tilt and telescopic adj.	OTP-TT 700	150Z0005	A1	134	566	6,0

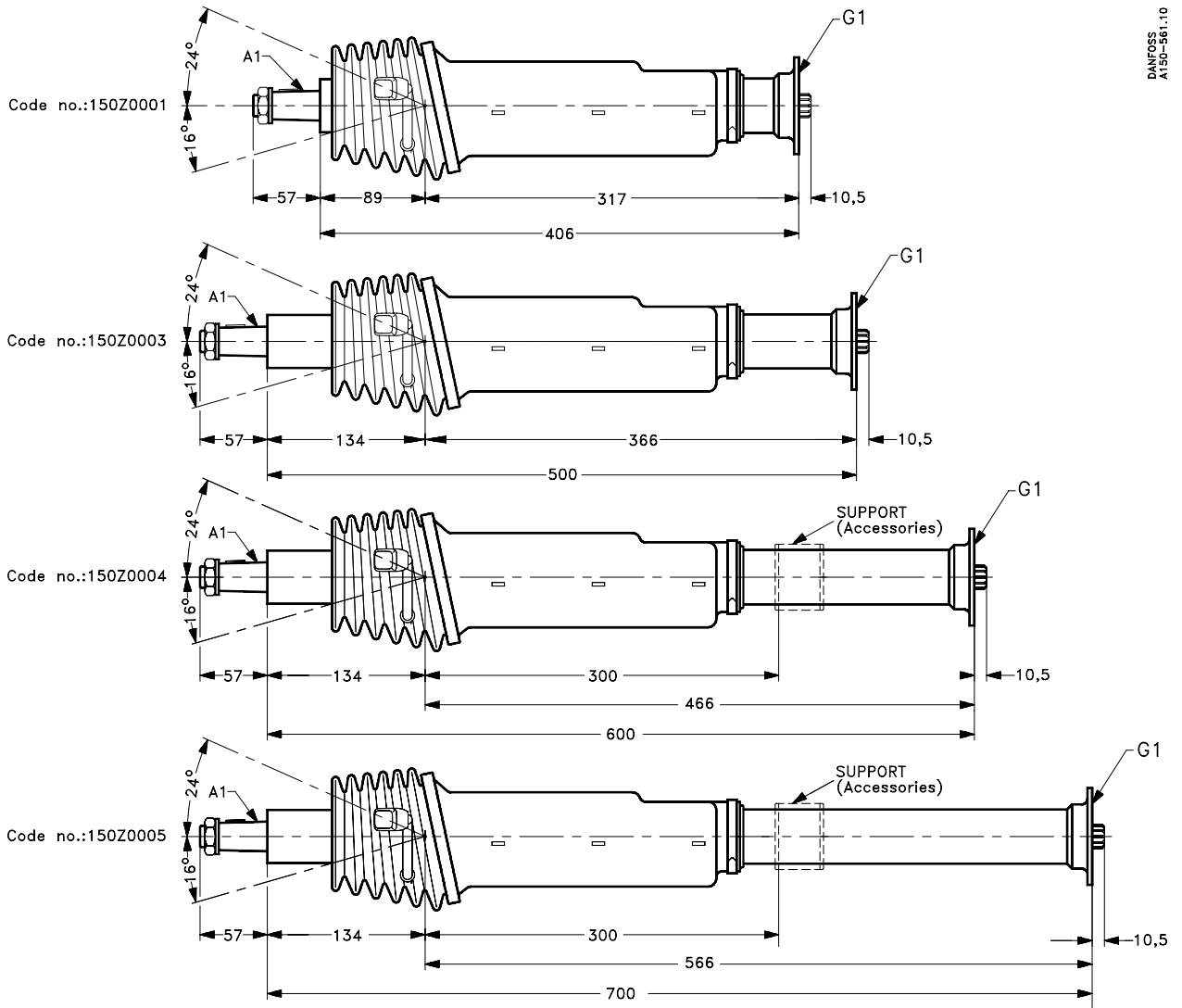
*) All with tilt-angle D_1 . (See page 6).

**) The E-measure applies to retracted condition. Fully extended add 80 mm.

Surface treatment : - Zink chromate (yellow)
 Material : - Cover, black plastic (ABS Terluran 967 K)
 Material : - Bellows, black rubber (EPDM 50 - 60 IRHD)

Dimensions standard range

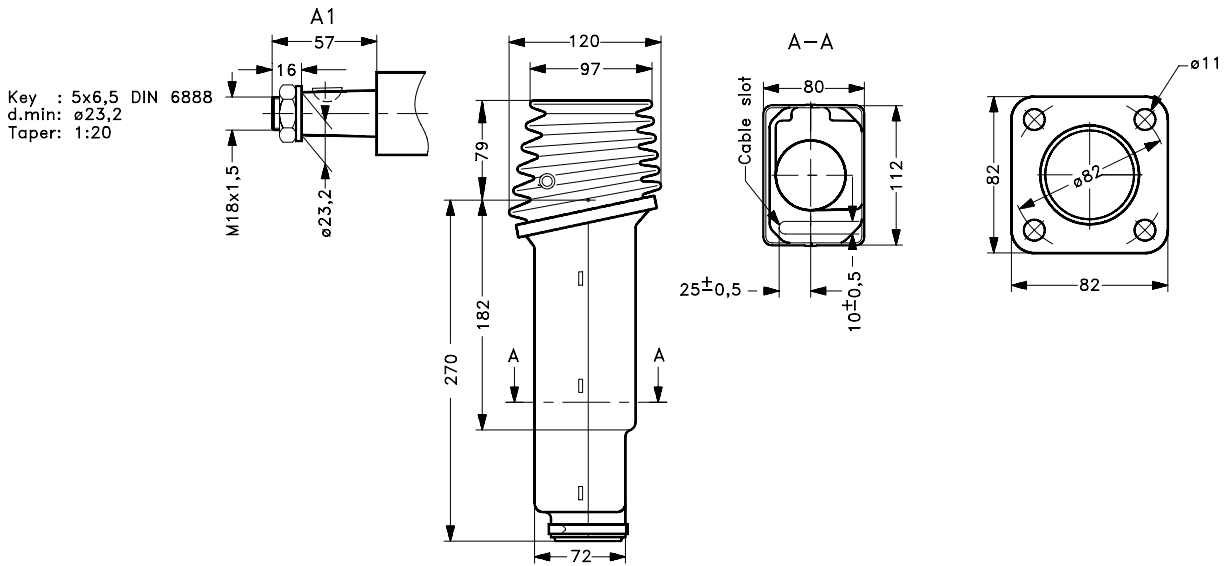
DANFOSS
A150-581.10



Steering wheel shafts A

Cover/Rubber bellow

Bracket G



Customer-specified versions

The following information must accompany enquiries for special versions:

Customer: **Date:** **Signature:**

Type: Adjustable tilt and telescopic
 Telescopic
 Adjustable tilt

¹⁾ **Steering shaft type:** A1 A2 A3 A4 A5 A6

Upper part: B1 B2 B3

Length: B: mm $B_{min.}$ 89 mm
 $B_{max.}$ 250 mm

Length: E: mm $E_{min.}$ 317 mm
 $E_{max.}$ 600 mm

³⁾ **Bracket:** G1 G3

³⁾ **Tilt stop angle:** D1 D2

Shaft end length: H: mm ($H_{min.}$ = 6,5 mm) ²⁾

Cover: yes no
Cover prepared for wire: yes no

Rubber bellow: yes no

Annual requirements (min 100 -pcs) **Pcs:**

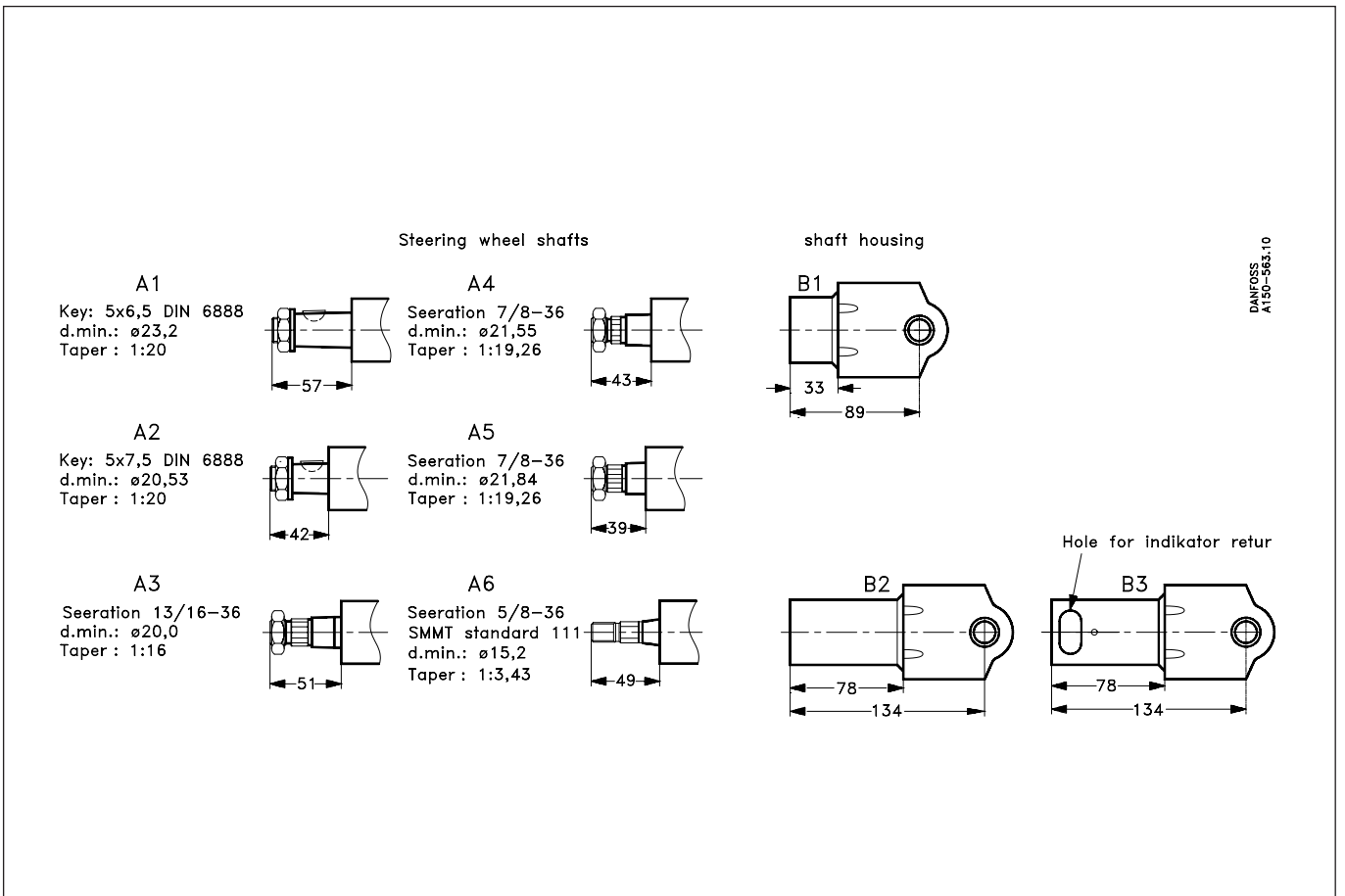
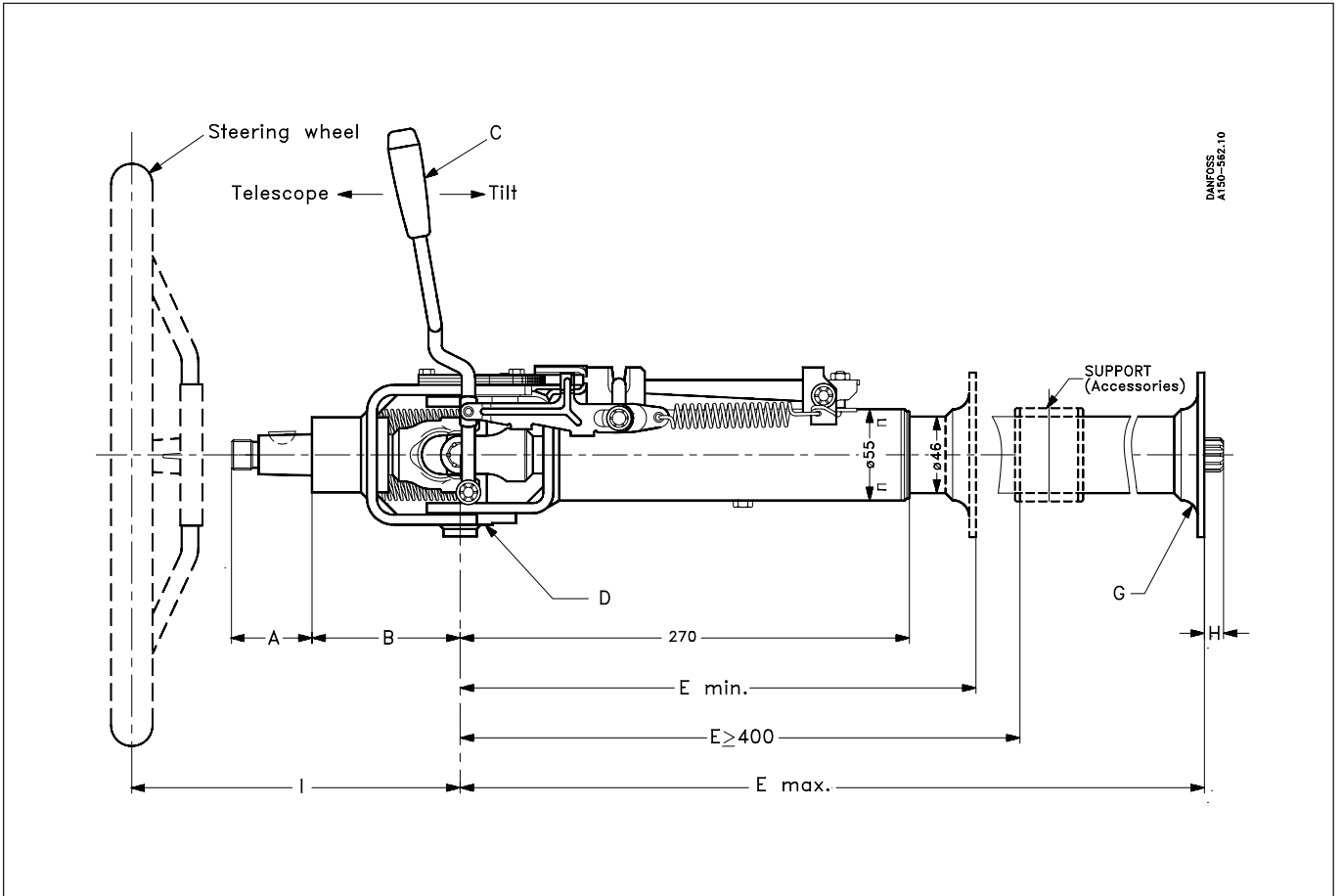
1) Splined shaft for A3, A4 and A5, see Danfoss steering unit catalogue, HK.20.B1.02.

2) $H_{min.}$ = 6,5 mm applies for OTP-TT fitted direct on the Danfoss steering unit.

3) See drawings page 6.

Note that mounting is different from standard range if H-dimension deviates from 10,5 mm.

Dimensions of customer-specified versions



Code numbers and weights of other versions

Description	Type designation	Code no. *)	Steering-shaft end (A)	Length B mm	Length E mm	Tilt stop angle	Weight kg	Bracket
Tilt and telescopic adj.	OTP-TT 406	150Z0002	A6	89	317	D1	5,4	G3
Tilt and telescopic adj.	OTP-TT 670	150Z0006	A1	134	536	D2	5,9	G2

Dimensions other versions

