TL117000

Selection Guide

1 RANGE AND MODEL CROSS REFERENCE

AXIAL Range	
Previous Model	**New Model**
AE 30-32	AF 30-35
AC 50-55	AF 50-55
AC 50-65	AF 50-90
AC 50-80	AF 50-90
AC 51-00	AF 50-90
AD 50-90	AF 50-90
AC 61-25	AD 61-30
AC 61-35	AD 61-30
AC 61-60	AD 61-55
AC 72-00	AD 72-00
AC 82-45	AD 72-45
	AF81-80
	AF83-20
	AF83-40

FOCAL Range	
Previous Model	**New Model**
FN 50-85	-------
FV 61-00	-------
FV 61-30	FV 61-40
FV 61-40	-------
FV 71-70	FN 71-65
FN 72-00	FN 71-95
FN 72-20	-------
FN 72-40	-------

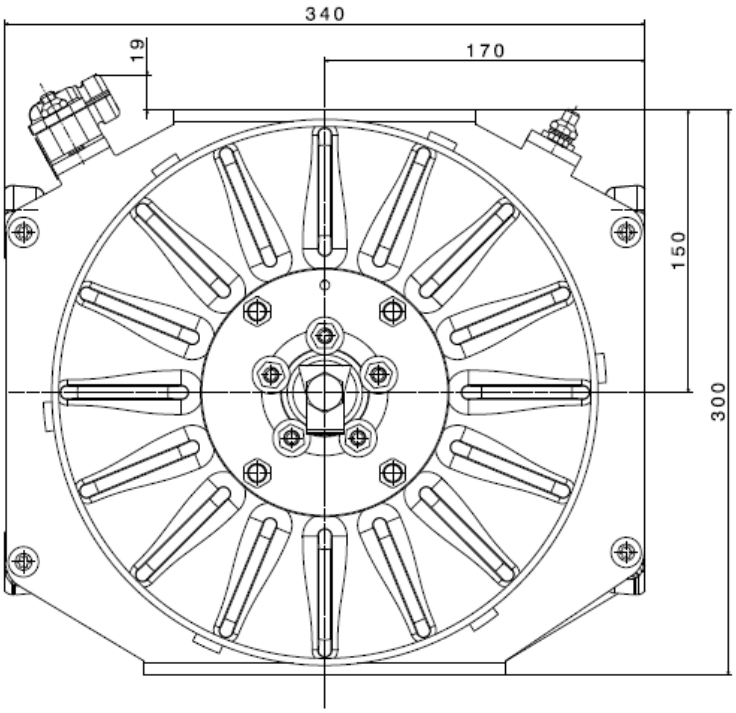
Example
AC 82-45
↓ ↘
Index Letter — Index Number

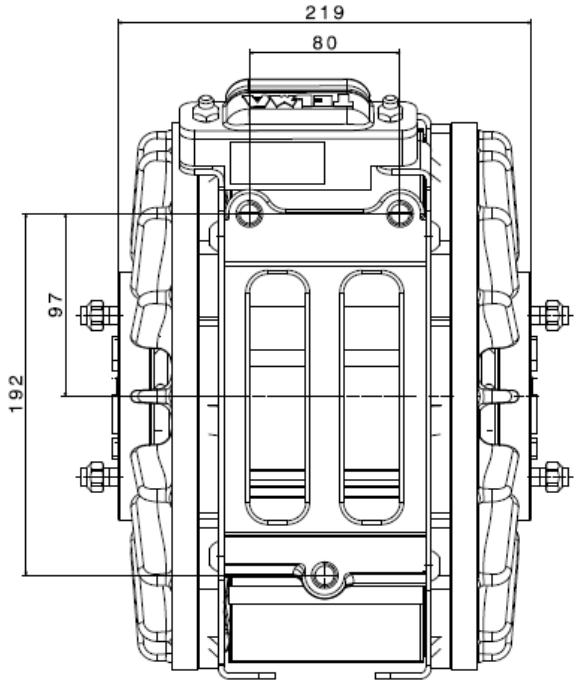
Index Number	Rotor Diameter
3	251 to 300 mm
5	351 to 400 mm
6	401 to 450 mm
7	450 to 505 mm
8	506 to 550 mm

Index Letter		
AXIAL	E	CE Range
	C	AC Range
	D	AD Range
	F	AF Range
FOCAL	V	Old Generation Rotor
	N	New Rotor

 Telma Retarder Inc. Toll Free: 800.797.7714 (USA only) Tel: 847.593.1098 Fax: 847.593.3592 www.TelmaUSA.com

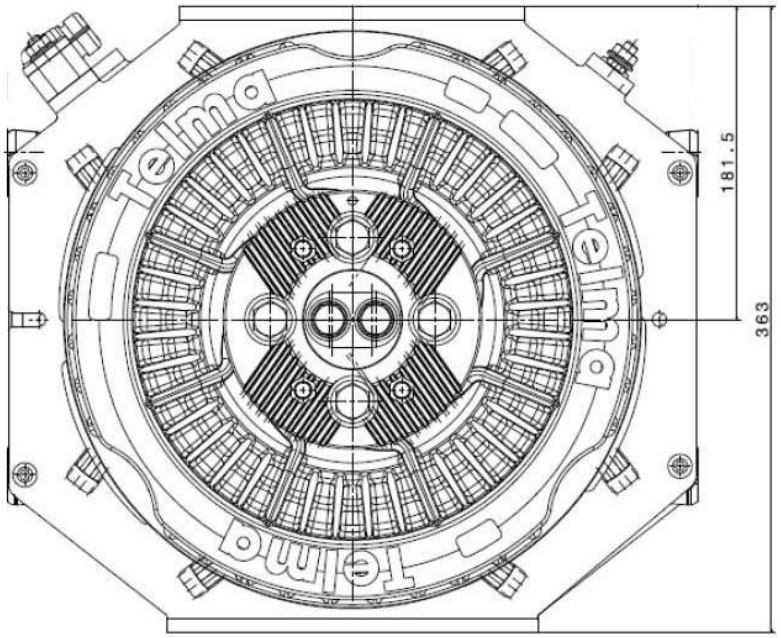
2 SPECIFICATIONS
2.1 AF30-35

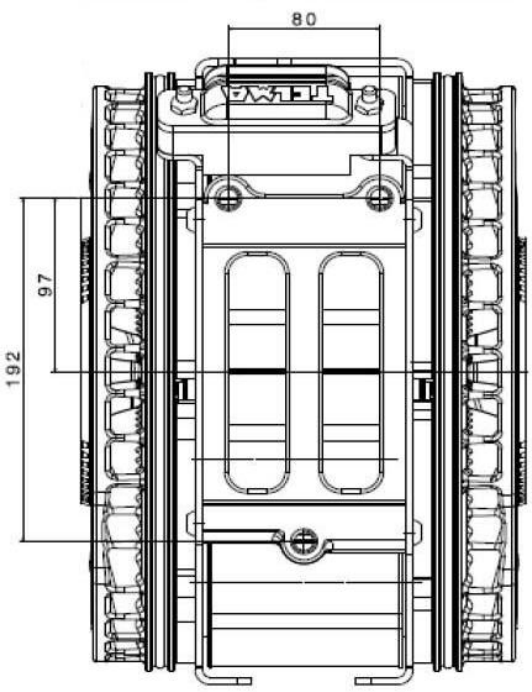




MODEL	DIMENSIONS			HORSE POWER AT 2500 rpm	MAXIMUM BRAKING TORQUE LB.-FT	WEIGHT LBS	AIR GAP INCHES	SHAFT TORQUE LIMIT LB.-FT	AMPS PER STAGE	NUMBER OF STAGES
	height	width	Length rotor to rotor							
AF30-35	11 13/16	13 3/8	8 1/4	120	258	128	0.031	2460	32	3

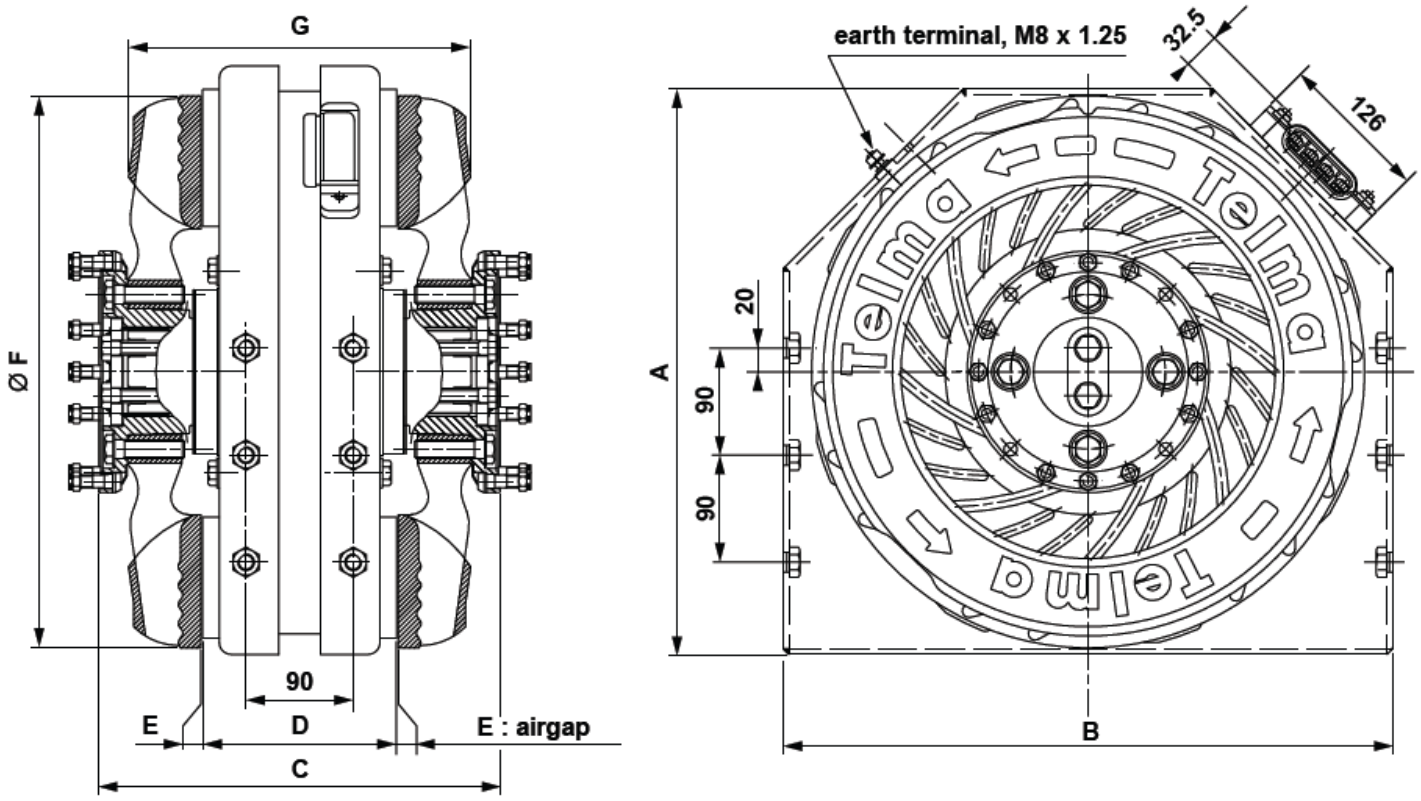
2.2 AF5 RANGE





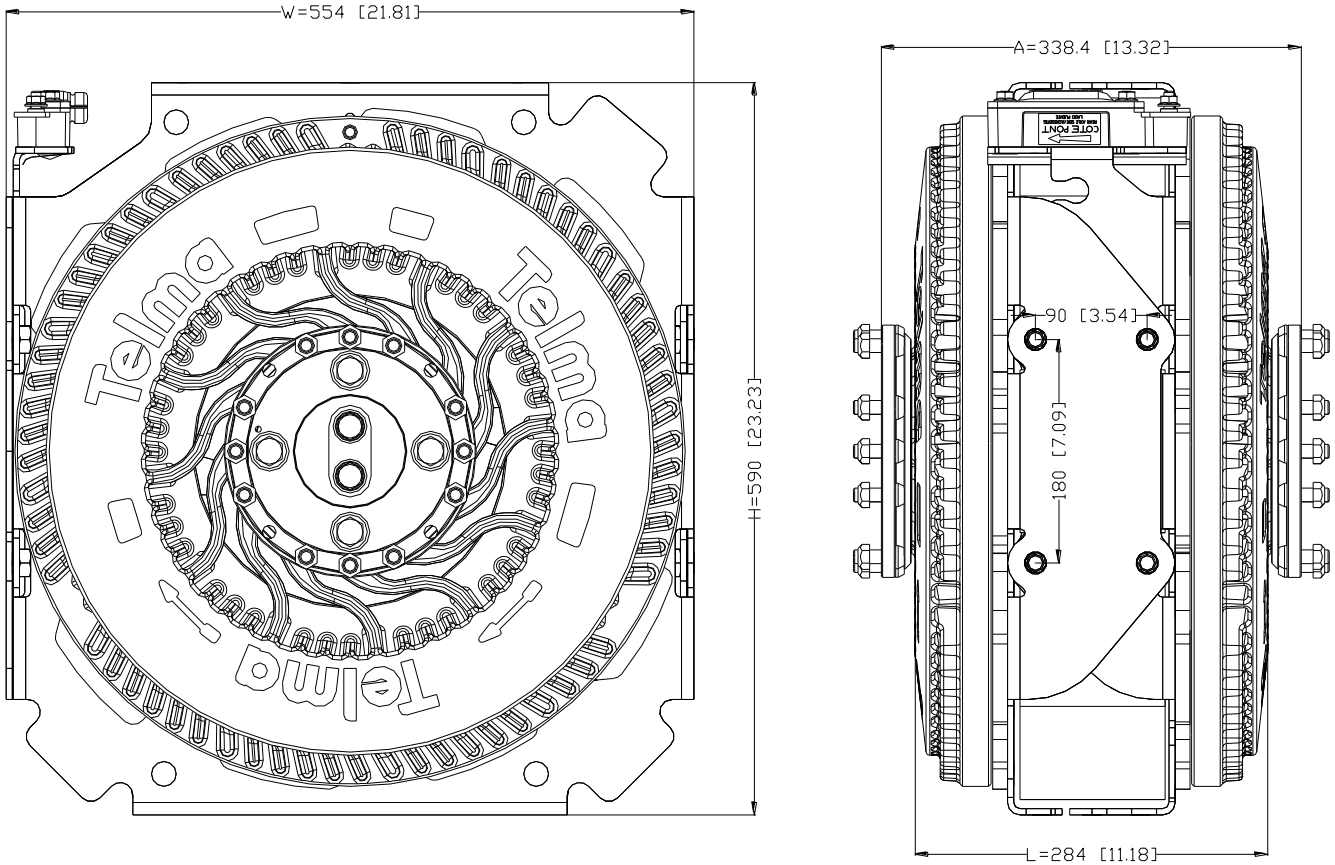
MODEL	COMMENTS	DIMENSIONS			HORSE POWER AT 2500 rpm	MAXIMUM BRAKING TORQUE LB.-FT	WEIGHT LBS	AIR GAP INCHES	SHAFT TORQUE LIMIT LB.-FT	ELECTRICAL CONSUMPTION	MAX RPM
		height	width	Length rotor to rotor							
AF50-55	Replaces AC50-55	14 1/4	14 3/4	8 3/4	211	443	209	0.039	6003	22A per stage 12V	5000
AF50-90	Replaces AD50-90	14 1/4	15 3/4	8 3/4	316	663	223	0.039	6003	49A per stage 12V	

2.3 AD RANGE



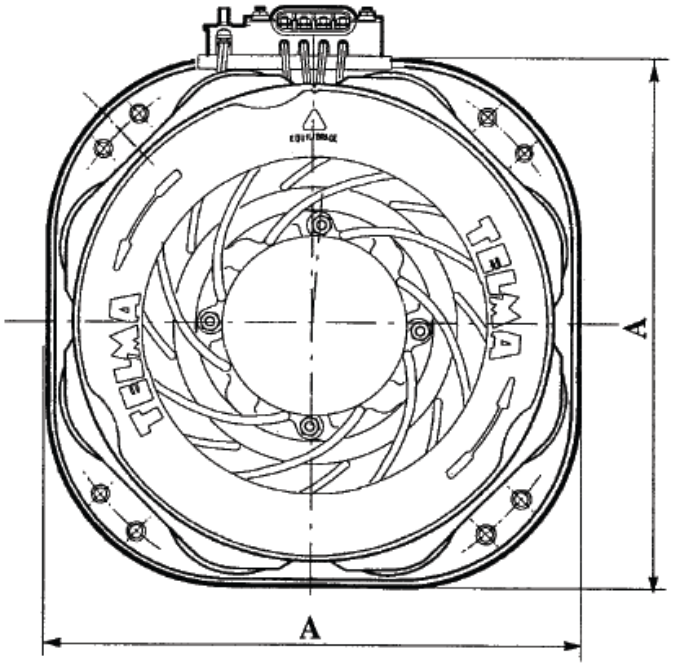
MODEL	REPLACES	DIMENSIONS			HORSE POWER AT 2500 rpm	MAXIMUM BRAKING TORQUE LB.-FT	WEIGHT LBS	AIR GAP INCHES	SHAFT TORQUE LIMIT LB.-FT	AMPS PER STAGE	MAX RPM
		A	B	G							
AD61-30	AC61-25	18	19 1/2	11 7/16	350	959	419	0.039	7670	33	4000
AD61-55	AC61-60	18	19 1/2	11 7/16	450	1180	434	0.055	7670	54	
AD72-00	AC72-00	18 3/4	20 7/16	11 1/4	600	1475	507	0.055	19177	60.5	3000
AD72-45	AC82-45	19 1/2	20 7/16	11 1/2	680	1770	551	0.047	19177	61	

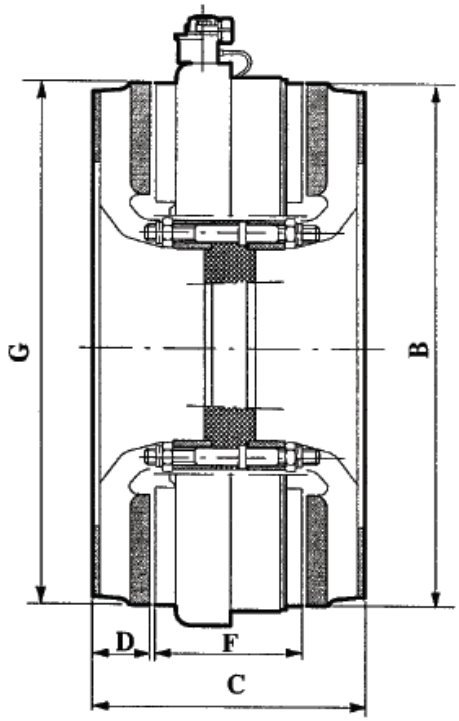
2.4 AF8 RANGE



MODEL	COMMENTS	HORSE POWER AT 2500 rpm	MAXIMUM BRAKING TORQUE LB.-FT	WEIGHT LBS	AIR GAP (INCHES)	SHAFT TORQUE LIMIT LB.-FT	TOTAL ELECTRICAL POWER CONSUMPTION (WATTS)	MAX RPM
AF83-10	Industrial only (96V/192V)	1088	2286	631	0.051	19177	3840	3000
AF81-80	12V	632	1327	708	0.051	19177	1038	
AF83-20	12V/24V	1123	2360	736	0.051	19177	2472	
AF83-40	12V/24V	1194	2508	728	0.051	19177	3360	
AF83-60	24V	1264	2655	708	0.051	19177	4152	
AF84-20	Industrial only (96V/192V)	1475	3098	736	0.051	19177	6336	

2.5 FOCAL RANGE





MODEL	REPLACES	DIMENSIONS INCHES			HORSEPOWER AT 2500 rpm	MAXIMUM BRAKING TORQUE LB.-FT	WEIGHT LBS	AIR GAP INCHES	AMPS PER STAGE 12V
		A	B	C					
FV61-00	------	18 1/4	18 1/4	8 1/2	263	737	256	0.051	37
FV61-40	------	18 1/4	18 1/4	8 1/2	351	1032	286	0.051	52.5
FN71-65	FV71-70	20 5/16	20 5/16	9 7/16	450	1179	359	0.055	50
FN71-95	FN72-00	20 5/16	20 5/16	9 7/16	540	1400	362	0.061	58.4
FN72-20	------	20 5/16	20 5/16	9 7/16	585	1621	381	0.061	69.4
FN72-40	------	20 5/16	20 5/16	9 1/2	702	1769	407	0.061	75

3 CALCULATIONS

3.1 Vehicle Data Worksheet and Torque Factor Calculation

- The following information is needed to calculate the **Torque Factor**

GVWR / GCWR (lbs.)*

Rear Tire Size

Static Loaded Radius
(SLR - inches) – see Tire Radius Table

Rear axle final drive ratio

***** *Gross Vehicle Weight Rating (GVWR) – straight trucks*
Or *Gross Combination Weight Rating (GCWR)- tractors or straight trucks with trailers*
Or *Final vehicle or combination weight if less than GVWR / GCWR*

- **Torque Factor =**

$$\frac{\text{(GVW or GCW) x (Loaded tire radius in inches)}}{\text{(Drive Axle Ratio) x 88.5}} = \frac{\square}{\square} \times \frac{\square}{88.5} = \square$$

- For control system kit selection indicate:

Type of Brakes (hydraulic or air activated) ----------

ABS (yes or no) ----------

Type of Telma Control System (hand / foot / dual) **---------**

- For flange yoke selection indicate u-joint series: -------

- For Axial Series shaft torque limit calculation indicate:

Engine maximum torque rating (lb-ft) ----------

Transmission lowest gear ratio (first or reverse) ---------

Automatic transmission torque converter ratio
or 1.0 for manual transmission ----------

- **Transmission make and model: ----------**

- **Axle make and model** (Focal applications)**: ----------**

3.2 Tire Radius Table

Tire Size	Radius	Tire Size	Radius	Tire Size	Radius
10-22.5	19.2	11.00R-24.5	20.6	14.00-24	25
10.00-20	19.7	11R-22.5	19.7	14.00-25	25.3
10.00-22	20.6	11R-24.5	20.7	14/80R-20	19.6
10.00-24	21.6	12-22.5	20.1	15-19.5	18.4
10.00R-20	19.7	12.00-20	21	15-22.5	19.8
10.00R-22	20.7	12.00-24	22.9	15R-22.5	19.6
10R-22.5	19.5	12.00R-20	20.4	16-25	28.2
11-22.5	19.7	12.00R-22	21.4	16.5-19.5	18.9
11-24.5	20.6	12.00R-24	22.4	16.5-22.5	20.5
11.00-18	19.2	12R-22.5	20.7	16.5R-22.5	20.1
11.00-20	20.1	12R-24.5	20.2	18-19.5	19.5
11.00-22	21.1	13.00-20	22	18-22.5	20.9
11.00-24	22	13.00R-20	21.2	18R-22.5	21.5
11.00R-20	20.2	13/80R-20	19.1	19.5-19.5	20.3
11.00R-22	21	14-17.5	16.5	20.5R-25	25.8
11.00R-24	22	14.00-20	23	215/75R-17.5	14.2
215/85R-16	14.3	7.00-16	14.4	8.25-18	17.2
21R-25	28	7.00-20	16.9	8.25-20	18.2
225/70R-19.5	15	7.00R-16	14.3	8.25R-15	15.5
225/75R-16	13.6	7.50-16	15	8.25R-17	16
235/80R-22.5	17.4	7.50-17	16	8.25R-20	18.1
235/85R-16	14.7	7.50-18	16.4	8.75-16.5	13.8
245/70R-19.5	15.7	7.50-20	17.4	8R-19.5	15.7
245/75R-22.5	17.4	7.50R-16	14.6	9-19.5	16.9
255/70R-22.5	17.1	7.50R-17	15.8	9-22.5	18.1
265/75R-22.5	18.2	7.50R-20	17	9.00-18	18
275/80R-22.5	18.8	7.75-15	13.1	9.00-20	19
275/80R-24.5	19.3	8-17.5	14.9	9.00R-20	19.1
285/75R-24.5	19.7	8-19.5	16	9R-17.5	15.5
295/75R-22.5	19	8.00-16.5	13.4	9R-22.5	18.1
315/75R-22.5	19.2	8.25-15	15.6		
315/80R-22.5	19.7	8.25-17	16.7		

3.3 Axial Model Selection and Shaft Torque Limits

(Skip this page for focal applications)

Use the table below to choose the model with a Torque Rating as close as possible to the calculated Torque Factor and for the u-joint series of the vehicle.

Example: For a calculated Torque Factor of 1256 and a u-joint series of 1610, the appropriate AXIAL model would be AD61-30 part number BC301152.

Axial Model Selection Table

Torque Rating	U-Joint Series	Model	Part Number
550	1410 (SPL36) / 1480 (SPL55) / 1550 (SPL70)	AF 50-55	LFA101156
900	1480 (SPL55) / 1550 (SPL70) / 1610 / SPL90 / SPL100	AF 50-90	LBA101158
1300	1610 / SPL90 / 1710 / SPL140	AD 61-30	BC301152
1600	1610 / SPL90 / 1710 / SPL140	AD 61-55	BD301152
2000	1710 / 1760 / 1810 / SPL140* / SPL170 / SPL250	AD 72-00	BE301157
2400	1710 / 1760 / 1810 / SPL140* / SPL170 / SPL250	AD 72-45	BH301157
1800	1710 / 1810 / SPL170 / SPL250	AF 81-80	LPA102138
3200	1710 / 1760 / 1810 / SPL140* / SPL170 / SPL250	AF83-20	LTA101157
3400	1710 / 1760 / 1810 / SPL140* / SPL170 / SPL250	AF83-40	LMA101157

- *Flange yoke holes must be enlarged to 7/16” diameter
- Divide the torque rating by the calculated torque factor. The result should not exceed 1.2

Note: All part numbers listed are for 12-volt systems. Contact Telma for other applications.

Comparing Driveline Torque to Shaft Limits

Estimate maximum driveline torque by making the following calculation and comparing to shaft torque limits in the table below. The driveline torque calculation should not exceed the Telma shaft torque limits. For applications such as off road applications with special gearing, obtain lowest gear ratios of main transmission, auxiliary transmission or transfer case. Contact Telma for a more detailed analysis.

Multiply

Engine Maximum Torque Rating (lb-ft)
X
Transmission lowest gear ratio (5.0 typical)
X
Torque converter ratio (2.0 typical) = _____

Model	Shaft Torque Limit (lb-ft)
AF 50-55 / AF 50-90	6003
AD 61-30 / AD 61-55	7670
AD 72-00 / AD 72-45 AF 81-80 / AF 83-20 AF 83-40	19177

3.4 Flange Yokes for Axial Applications

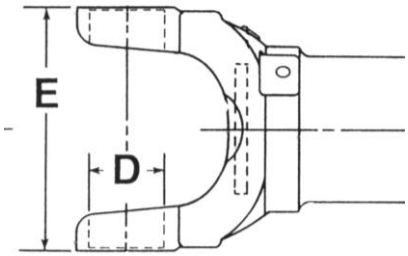
(Skip this page for focal applications)

Choose the Flange Yokes

Axial model installations require two flange yokes for each installation. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. There is a limited inventory available from Telma for some Spicer flange yokes.

Use the figure and table below to identify the driveline series and select the flange yoke for your application.

The flange index refers to the last three digits of the Telma part number.



Flange Yoke Selection Table

Driveline u-joint Series	E Approximate Distance across lugs	D Approximate Bearing diameter	Flange index (last 3 digits of the part number)	Telma flange yoke part number	Spicer flange yoke part number
1350 (SPL30)	3 7/8”	1 3/16”	154	n/a	3-2-119
1410 (SPL36)	4 7/16”	1 3/16”	155/156	TIF01080	3-2-429
1480 (SPL55)	4 7/16”	1 3/8”	155/156	TIF01081	3-2-479
1480 (SPL55)	4 7/16”	1 3/8”	158	n/a	3-2-499
1550 (SPL70)	5 1/4”	1 3/8”	158	TIF01088	4-2-689
SPL90/SPL100	5”	1 5/8”	158	n/a	90-2-19
SPL90/SPL100	5”	1 5/8”	152	n/a	90-2-69-1
1610	5 5/16”	1 7/8”	158	TIF01091	5-2-279
1610	5 5/16”	1 7/8”	152	TIF01090	5-2-629
SPL140	5”	1 15/16”	152/157**	n/a	140-2-99-1
1710	6”	1 15/16”	152	TIF01093*	6-2-749-1
1710	6”	1 15/16”	157	TIF01094*	6-2-779-1
1760	7”	1 15/16”	157	TIF01095*	6.3-2-19-1
SPL170	6 7/16”	2 3/16”	157	n/a	170-2-19
1810	7 1/2”	1 15/16”	157	TIF01097*	6.5-2-329-1
SPL250	6 7/16”	2 3/8”	157	n/a	250-2-49-1

* Half Round flange yoke

** Flange yoke holes must be enlarged to 7/16” diameter for 157 index

4 AXIAL UNIVERSAL INSTALLATIONS

4.1 Universal Installation Selection

Choose one part number from each category for a complete installation.

1. Telma

Choose the Telma part number based on the Torque Factor calculation and driveline series

2. Universal Outside Mounting Kit

Choose mounting kit **TIK03001** for all AD applications. Choose mounting kit **TIK03003** for all AF8 applications.
Note1: Contact Telma technical support for AF50-55 and AF50-90.
Note2: If inside mount chassis brackets are desired contact Telma technical support.

3. Universal Control System Kit (12V) with TRCM2a and Wiring Harness

Choose one part number based on the application.

Hydraulic Brake Vehicles	TIK10106*
Air Brake Vehicles	TIK10108
Air Brake Vehicles (IRCS)	TIK10101

IMPORTANT

* TIK10106 includes a universal rotary foot switch mounting bracket that may need to be modified for your application. Contact Telma technical support to help determine the best way to modify.

Note 1: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above
Note 2: Refer to telmausa.com technical website for general wiring diagrams.
Contact vehicle manufacturer or Telma Technical Department for specific connections to the vehicle.

4. Flange Yokes

Refer to section 3.4 to choose a Spicer flange yoke part number based on the u-joint series and Telma flange index. A quantity of two are needed for each Telma installation. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. There is a limited inventory available from Telma for some Spicer flange yokes.

5. Additional Requirements

Driveline modification: to be provided by the installer.
An electrical system upgrade may be necessary, depending on vehicle electrical needs, Telma model used, and vehicle vocation. As an example, a 200-amp alternator and 4 group-31 high cycle batteries is a typical recommendation for some refuse applications.

6. Installation Time

Average install time including Telma mounting and wiring is 16 –20 hours.

4.2 GROUPED UNIVERSAL AXIAL KITS

1. Telma Unit

The Telma unit is included in the kit
Choose the kit below based on the Torque Factor calculation, the shaft torque limits, and u-joint size.

2. Mounting kit

Most mounting kits use universal outside mounting chassis brackets TIB03104. The brackets that mount to the retarder (TIB03115) are now zero degree so the left and right side are the same.

If there is a need to use chassis brackets that mount to the inside of the frame we have made available one kit shown in the table below for model AD72-45.

3. Controls

Controls included are universal foot control for air brakes with TRCM2 control module.
Note 1: If your vehicle has hydraulic brakes contact Telma technical support to determine the parts needed to order in addition to one of the kits below.
Note 2: Refer to telmausa.com technical website for general wiring diagrams.
Contact vehicle manufacturer or Telma Technical Department for specific wiring connections.
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

4. Flange Yokes

Two flange yokes are needed for each installation and are not included in the kits. Refer to section 3.4 to choose a Spicer flange yoke part number based on the u-joint series and Telma flange index. A quantity of two are needed for each Telma installation. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. There is a limited inventory available from Telma for some Spicer flange yokes.

Choose a kit from the table below based on the items mentioned above

Torque Rating	Telma Model	Telma part number in kit	Chassis bracket mounting	Controls	Compatible with U-Joint Series *(yokes not included in kits)*	Brakes Air / Hyd	Part Number
900	AF50-90	LBA101158	outside	foot	1480, 1550, 1610, SPL90	Air	TIK13136
1300	AD61-30	BC301152	outside	foot	1610 / SPL90 / 1710 / SPL140	Air	TIK13137
1600	AD61-55	BD301152	outside	foot	1610 / SPL90 / 1710 / SPL140	Air	TIK13138
2000	AD72-00	BE301157	outside	foot	1710 / 1760 / 1810 / SPL140 / SPL170 / SPL250	Air	TIK13139
2450	AD72-45	BH301157	outside	foot		Air	TIK13140
2450	AD72-45	BH301157	***inside***	foot		Air	TIK13141
1800	AF81-80	LPA102138	outside	foot		Air	TIK13142
3200	AF83-20	LTA101157	outside	foot		Air	TIK13143

5 AXIAL kits by Application

5.1 Chevrolet 4500 Express Cutaway

2012 and newer Chevrolet 4500 Express Cutaway chassis with dual rear wheels

1. Installation Kit

Gasoline 6.0L engine all wheelbases

↳ Order installation kit part number – **TIK10319**

Note 1: This kit includes Telma model AF50-55 / part number LFA101156 and complete wiring harness with TRCM2 control module.
Note 2: This kit does not include drivelines or flange yokes
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

2. Flange Yokes

Two 1480 flange yokes Spicer part number 3-2-479 are needed for each installation and are not included in the kits. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier.

3. Additional Requirements

Driveline modification: to be provided by the installer
Exhaust modification required

4. Installation Time

Average install time including Telma mounting and wiring is 8 –10 hours for a chassis without a body.

5.2 Ford Econoline Cutaway

2010 and newer Ford Econoline Cutaway chassis with dual rear wheels

5. Installation Kit

E350 and E450 all wheelbases

↳ Order installation kit part number –**TIK10613**

Note 1: This kit includes Telma model AF50-55 / part number LFA101156 and complete wiring harness with TRCM2 control module.
Note 2: This kit does not include drivelines or flange yokes
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

6. Flange Yokes

7. Two 1410 flange yokes Spicer part number 3-2-429 are needed for each installation and are not included in the kits. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier.

8. Additional Requirements

Driveline modification: to be provided by the installer

9. Installation Time

Average install time including Telma mounting and wiring is 8 –10 hours for a chassis without a body.

5.3 Ford F450/550 and F53

2012 and newer F450/550 and F53

1. Installation kit

2021 and newer F53

↳ Order installation kit part number – **TIK10615** (includes AF50-90 / LBA101158)

2017 and newer F450/550

↳ Order installation kit part number – **TIK10614** (includes AF50-90 / LBA101158)

Note 1: This kit includes Telma model AF50-90 / part number LBA101158 and complete wiring harness with TRCM2 control module.
Note 2: This kit does not include drivelines or flange yokes
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

2. Flange Yokes

Two 1480 flange yokes Spicer part number 3-2-499 are needed for each installation and are not included in the kits. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier.

3. Additional Requirements

Driveline modification: to be provided by the installer

4. Installation Time

Average install time including Telma mounting and wiring is 8 –10 hours for a chassis without a body.

5.4 Ford F650

1. Installation kit

- For chassis with SPL100 u-joints, gasoline engine, and hydraulic brakes order part number – **TIK10611**
- For chassis with SPL140 u-joints, diesel engine, and hydraulic brakes order part number – **TIK10612**

Note 1: TIK10611 includes AF50-90 retarder (LBA101158).
Note 2: TIK10612 includes AD61-30 retarder (BC301152).
Note 3: Wiring harness, outside mount chassis brackets and TRCM2 control module included.
Note 4: These kits do not include drivelines or flange yokes
Note 5: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

2. Flange Yokes

- For TIK10611 with AF50-90 two SPL90 flange yokes Spicer part number 90-2-19 are needed for each installation and are not included in the kits.
- For TIK10612 with AD61-30 two SPL140 flange yokes Spicer part number 140-2-99-1 are needed for each installation and are not included in the kits.

Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. Contact Telma technical support before ordering the kit if the chassis is not equipped with SPL90 u-joints.

3. Additional Requirements

Driveline modification: to be provided by the installer

4. Installation Time

Average install time including Telma mounting and wiring is 8 –10 hours for a chassis without a body.

5. Air brake chassis with u-joint size larger than SPL90/100

For Ford F650/F750 chassis with higher GVW, air brakes and u-joints larger than SPL90/100 go to section 3.1 to determine appropriate Telma and section 4.1 to choose a grouped axial kit.
Note: OBD pass through harness TID31013 will also need to be ordered in addition to the grouped kit.

5.5 Navistar ICBus HC/Durastar and UC/Terrastar bus cutaway with SPL90 u-joints and GVW = less than 21,000Lbs

1. Installation kit

↳ Order installation kit part number – **TIK11214***

*For air brake chassis order pressure transducer TIG31065 and transducer harness TID11051a in addition to TIK11214

Note 1: This kit includes AF50-90 retarder (LBA101158), wiring harness, outside mount chassis brackets and TRCM2 control module.
Note 2: These kits do not include drivelines or flange yokes
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

2. Flange Yokes

Two SPL90 flange yokes Spicer part number 90-2-19 are needed for each installation and are not included in the kits. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. Contact Telma technical support before ordering the kit if the chassis is not equipped with SPL90 u-joints.

3. Additional Requirements

Driveline modification: to be provided by the installer

4. Installation Time

Average install time including Telma mounting and wiring is 8 –10 hours for a chassis without a body.

5. Air brake chassis with u-joint size larger than SPL90/100

For Navistar chassis with higher GVW, air brakes and u-joints larger than SPL90/100 go to section 3.1 to determine appropriate Telma and section 4.1 to choose a grouped axial kit.

5.6 Mack with inside chassis brackets

6. Installation kit

↳ Order installation kit part number – **TIK13135**

Note 1: This kit include AD72-45 retarder (BH301157), wiring harness, air brake transducer, inside mount chassis brackets for Mack TIB05043, retarder brackets TIB06000, and TRCM2 control module.
Note 2: These kits do not include drivelines or flange yokes
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above.

7. Flange Yokes

Two flange yokes are needed for each installation and are not included in the kits. Refer to section 3.4 to choose a Spicer flange yoke part number based on the u-joint series and Telma flange index. A quantity of two are needed for each Telma installation. Flange yokes can be ordered from a Spicer distributor or your drive shaft modifier. There is a limited inventory available from Telma for some Spicer flange yokes.

8. Additional Requirements

Driveline modification: to be provided by the installer

9. Installation Time

Average install time including Telma mounting and wiring is 14 –18 hours

6 FOCAL INSTALLATIONS

6.1 DANA 060S/S140/S170/S190 SINGLE AXLE

1. Telma →

Choose the Telma from the table based on the Torque Factor calculation.

Torque Rating	Model	Telma 12V Part Number Equipped with Rotor Spacer
1000	FV61-00	FU831310
1400	FV61-40	FJ791310
1600	FN71-65	DV311415
1900	FN71-95	DU311415
2200	FN72-20	DJ311415
2400	FN72-40	DK311415

2. Focal Mounting Kit

Choose a mounting kit from the table based on the Telma model chosen and the axle model.

This kit contains the stator carrier, companion flange and the necessary hardware to mount the Telma focal to the axle.

*TIK11207 is a partial kit including retarder, harness, and installation kit. Axle spotfacing is necessary. See table below for correct cutter and pilot size. Contact Telma for more information.

**S170/S190 need R (retarder ready) option axles. Carrier exchange available through Dana.

Telma Model	Axle Model→	Kit Part Number 060s	S140	S170/S190
FN50-85 SPL100		TIK11207*	TBD	NA
FV61-00 FV61-40		TIK12507	NA	NA
FN71-65 FN71-95 FN72-20 FN72-40		NA	NA	TIK12503**

3. Rent or Buy the Spot face Tool

The pinion cage of the axle must be spot faced before the Telma can be installed. Spot facing is a simple procedure to machine the surface of the pinion cage bolt holes. This avoids the need for a special pinion cage. A tool and procedure to perform this operation can be rented or purchased from Telma. Use the table below to order the correct Spot Face Tool. Contact Telma technical department for more details.

Axle Make/Model	Kit Includes Basic Tool and	RENT Spot Face Tool P/N	BUY Spot Face Tool P/N
Dana 060s	1 3/16” Counterbore 9/16” Pilot	TIR04003	TIT04003

4. Flange Yoke

Choose the flange yoke from the table. Only one flange yoke is needed for each installation.

Driveline Series	Flange Yoke Part Number
1610	VB107389
1710	VB107149
1760	VB107793
1810	VB107148

5. Universal Control System Kit (12V) with TRCM2a and Wiring Harness

Choose one part number based on the application. _____

Hydraulic Brake Vehicles	TIK10106*
Air Brake Vehicles	TIK10108
Air Brake Vehicles (IRCS)	TIK10101

IMPORTANT

* TIK10106 includes a universal rotary foot switch mounting bracket that may need to be modified for your application. Contact Telma to help determine the best way to modify.

Note 1: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above

Note 2: Refer to telmausa.com technical website for general wiring diagrams.

Contact vehicle manufacturer or Telma Technical Department for specific connections to the vehicle.

6. Installation Time

Average install time including Telma mounting and wiring is 8-12 hours.

6.2 Grouped FOCAL Universal Kits

1. Telma Unit

The Telma unit is included in the kit
Choose the kit below based on the Torque Factor calculation and the axle model.

2. Mounting kit

The focal mounting kit is included in the kit

3. Controls

Automatic Foot Controls are included in the kit.
Note 1: Kits below include Telma Control Module (TRCM2).
Note 2: Refer to telmausa.com technical website for general wiring diagrams.
Contact vehicle manufacturer or Telma Technical Department for specific wiring connections.
Note 3: To add manual dash mounted hand control order hand control switch JL1002530 and hand control harness TID31021 in addition to the kits above

4. Rent or Buy the Telma Spot Facing Tool

The pinion cage of the Meritor axle must be spot faced before the Telma can be installed. Dana tandem axles do not require spot facing. Spot facing is a simple procedure to machine the surface of the pinion cage bolt holes. This avoids the need for a special pinion cage. A tool and procedure to perform this operation can be rented or purchased from Telma. Use the table below for correct Spot Face Tool kits. Contact Telma technical department for more details.

Axle Make/Model	Kit Includes Basic Tool and	RENT Spot Face Tool P/N	BUY Spot Face Tool P/N
Meritor RS160-185	1 3/16” Counterbore 1/2” Pilot	TIR04000	TIT04000

5. Flange Yoke →

Choose the flange yoke from the table. Only one flange yoke is needed for each installation.

Driveline Series	Flange Yoke Part Number
1610	VB107389
1710	VB107149
1760	VB107793
1810	VB107148

Choose a kit from the table below based on the items mentioned above.

Torque Rating	Telma Model	Telma part number	Axle	Controls	Brakes Air / Hyd	Part Number
1600	FN71-65	DV311279	MERITOR RS160	foot	Air	TIK13145
1900	FN71-95	DU311279	MERITOR RS160	foot	Air	TIK13146
2200	FN72-20	DJ311279	MERITOR RS160	foot	Air	TIK13147
2400	FN72-40	DK311279	MERITOR RS160	foot	Air	TIK13148
1600	FN71-65	DV311279	MERITOR RS180	foot	Air	TIK13149
1900	FN71-95	DU311279	MERITOR RS180	foot	Air	TIK13150
2200	FN72-20	DJ311279	MERITOR RS180	foot	Air	TIK13151
2400	FN72-40	DK311279	MERITOR RS180	foot	Air	TIK13152
2400	FN72-40	DK311415	DANA D170	foot	Air	TIK13153
2400	FN72-40	DK311415	DANA D190	foot	Air	TIK13154

6. Installation Time

Average install time including Telma mounting and wiring is 8-12 hours.

7.0 Industrial “Dynamometer” Installations

Some Telma retarder models of the Axial series have been especially designed to best meet the specific requirements of dynamometer integration, such as engine torque measurements, braking capacity tests, or governmental emission test sites. In this area where every application has its own requirements, Telma guides clients in their projects so as to help them define the solutions best for meeting their needs. Almost all Telma units can be used in a non-vehicle industrial or “dyno” application as a power absorber. Telma has been the power absorber of choice for manufacturers and users worldwide for almost 50 years and is indispensable for mobile power absorption applications.
The three main points below which may be different from a vehicle need to be considered.

Electrical

Depending on the unit, Telma units are available or can be reconfigured for a variety of voltages to accommodate the power supply used. The technical specifications section of our website shows some of the different voltage configurations possible.

Speed

In addition to the standard bearings, Telma offers some units with special higher speed bearings for applications that require it.

Size

For industrial applications torque required to absorb, for how long, and at what speed need to be evaluated in detail. To determine the Telma that is best suited for your industrial application an application approval form and duty cycle form must be submitted. Examples are shown in the following pages. Download these forms from our website at https://telmausa.com/Downloads/FI002DP.xlsm and send them to engineering@telmacse.com so that we can determine the best retarder for your industrial application.
You can also look through the technical specifications sheets on our website to see some of the industrial configured units that have been created. If we have not already created a custom configuration for your needs we can evaluate your application and create a new configuration.

FI002DP R&D méca annexe 02 ind 01

Fiche de renseignements pour préconisation/ **Questionnaire for prescription** / Fragebogen für Empfehlung

P1 n°:

Société / **Company** / Firma | Nom / **Name** / Name | **Date** / Datum

e-mail | Tel | Pays / **Country** / Land

1. DESCRIPTION DU PROJET INDUSTRIEL / **INDUSTRIAL PROJECT DESCRIPTION** / INDUSTRIELLE PROJEKTBESCHREIBUNG

2. PERFORMANCES ATTENDUES / **REQUIRED PERFORMANCES** / BENÖTIGTE LEISTUNG

Couple maximum / **Maximum torque** / Maximales Bremsmoment (N.m.)

ou / or

Puissance maximum / **Maximum braking power** / Maximales bremsleistung (kW)

Vitesse de rotation maximum absolue / **Absolute maximum rotational speed** / Absolute maximale Drehzahl (min^{-1})

3. CYCLE D'UTILISATION / **DUTY CYCLE** / EINSATZZYKLUS

(Veuillez compléter les champs ci-dessous ET impérativement l'onglet Duty cycle / **Please complete fields below AND imperativey Duty cycle tab** / Bitte füllen Sie die untenstehenden Felder aus UND zwingend die Registerkarte Arbeitszyklus (Duty cycle))

Durée d'utilisation du ralentisseur / **Retarder operational duration** / Retarder Einsatzdauer (s)

Vitesse de rotation correspondante/ **Corresponding rotational speed** / Entsprechende Drehzahl (min^{-1})

Calcul du couple selon la puissance maximale & la vitesse de rotation/ **Calculated torque from maximum power and rotational speed** / Berechnung des Drehmoments nach maximum leistung und drehzahl

Calcul de la puissance selon le couple maximum et la vitesse de rotation / **Calculated power from maximum torque and rotational speed** / Berechnete Leistung aus maximalen drehmoment und Drehzahl

Durée de refroidissement du ralentisseur / **Retarder cooling duration** / Retarder Abkühlungsdauer(s)

Vitesse de rotation correspondante / **Corresponding rotational speed** / Entsprechende Drehzahl (min^{-1})

Durée d'arrêt entre 2 cycles / **Off duration between 2 cycles** / Stillstandszeit zwischen 2 Zyklen(s):

Nombre de cycles consécutifs (/ 24h)/ **Number of consecutive cycles** / Anzahl der aufeinander folgenden Zyklen:

4. Commande électrique du ralentisseur / **Retarder electrical control** / Elektrische Steuerung verzögern

Tension d'utilisation souhaitée / **Required voltage** / Benötigte Spannung (DC)

☐ 12V ☐ 24V ☐ 48V ☐ 96V ☐ 192V

Commande du ralentisseur gérée par TELMA / **Retarder electrical control handled by TELMA** / Steuerung des von TELMA verwalteten retarders Elektrische Steuerung des Retarders durch TELMA (Yes / No)

Yes <<more info>>

Avec les matériels TELMA, les clients bénéficient de toute notre expérience en matière de stratégies de commutation et de fonctions de sécurité développées au fil des ans, pour une utilisation optimale des ralentisseurs. Si votre entreprise préfère utiliser son propre système de commande, vous devez au moins vérifier, lors des tests, que le ralentisseur ne doit pas être alimenté électriquement si la vitesse de rotation est nulle et que le cycle de fonctionnement restera identique à celui défini dans le cahier des charges initial de l'application. Par conséquent, en cas de défaillance, si l'analyse détermine que la cause racine est liée au système de contrôle client, la garantie TELMA ne sera pas appliquée.

With TELMA products, customers benefit from all our experience in terms of switching strategies and safety functions developed over the years, for optimal use of retarders. If your company prefers to use its own control system, during the tests it must at least be checked that, the retarder must not be electrically supplied if rotational speed is null and the duty cycle will remain the same as defined by the initial application requirement. Nevertheless, in case of issue, if analysis determines that root cause is liaised with customer control system, TELMA warranty will not be applied.

Kunden profitieren bei TELMA Produkten von all unseren Erfahrungen in Bezug auf Schaltstrategien und Sicherheitsfunktionen, die im Laufe der Jahre für den optimalen Einsatz von Retardern entwickelt wurden. Wenn Ihr Unternehmen lieber ein eigenes Steuerungssystem verwenden möchte, muss während der Versuche zumindest die folgende Funktionalitäten überprüft werden : Der Retarder darf ohne Drehzahl nicht elektrisch versorgt werden, und der Arbeitszyklus bleibt derselbe wie in der ursprünglichen Anwendungsanforderung definiert. Im Falle eines Problems wird die TELMA-Gewährleistung jedoch nicht angewendet, wenn die Analyse feststellt, dass die Ursache mit dem Kundensteuerungssystem verbunden ist.

Type de plateau d'accouplement / **Coupling flange type** / Anschlussflanschtyp (SAE, XS...):

Classe d'équilibrage spécifique (défaut G16) / **Required balance grade (default G16)** / Erforderliche wuchtgüte (Klasse G16):

Si inertie à ralentir / **If inertia to be slown down** / Wenn eine Masseträgheit abgebremst werden muss ($kg.m^2$):

Conditions environnementales, réglementation, exigences de sécurité, directives,... / **Environmental conditions, regulation, safety requirements, directives,...** / Umgebungsbedingungen, Vorschriften, Sicherheitsanforderungen, Richtlinien,...

5. Volume de ventes estimées / **Estimated selling volume** / Vorgesehene Anzahl der Anlagen : (/ an / year / Jahr)

6. Date de montage prévue / **Expected date of installation** / Geplanter Montagetermin :

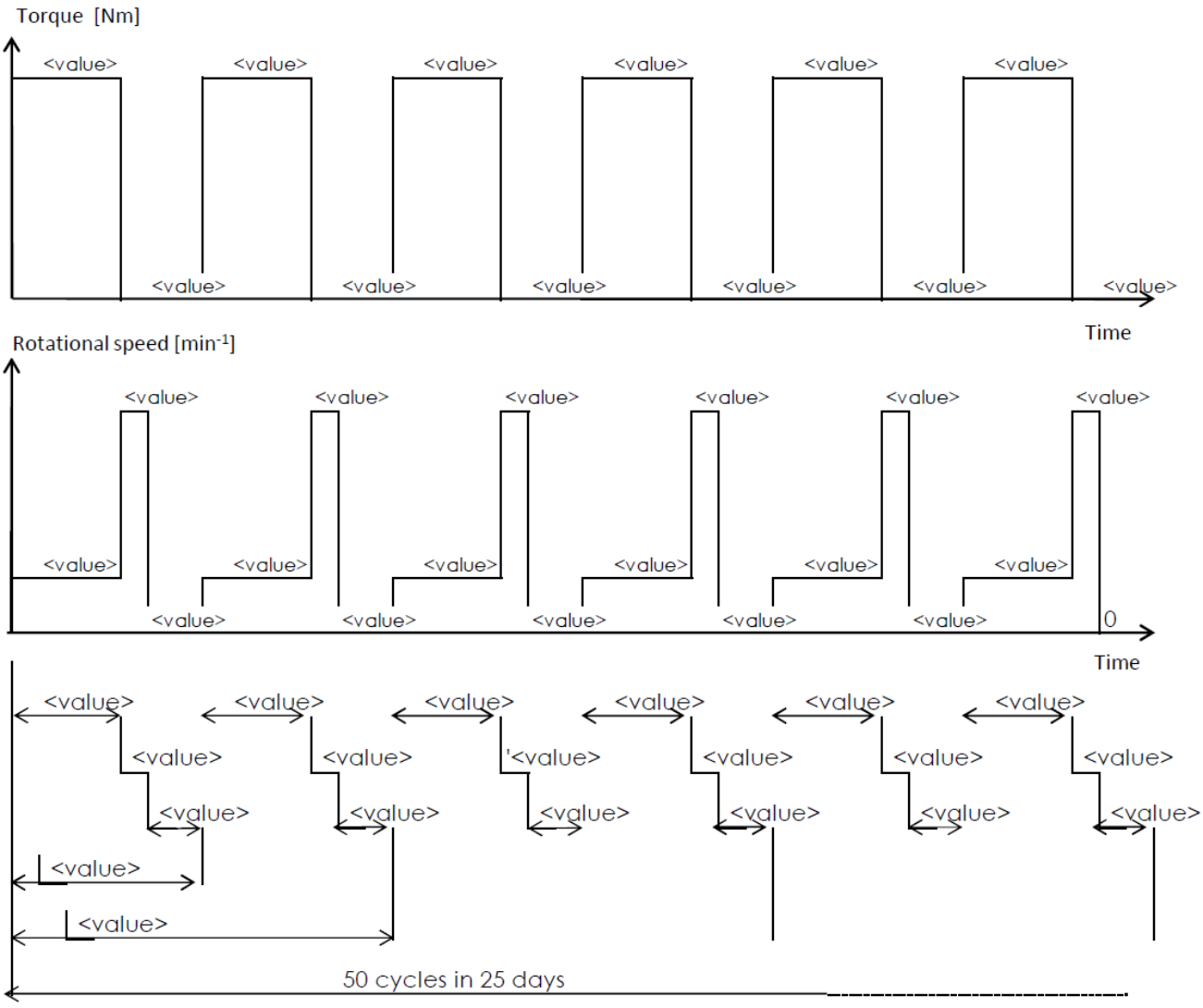
*Cadre réservé à TELMA / **Section reserved to TELMA** / Leerfeld reserviert für Telma*

*Choix ralentissseur pour l'application / **Retarder choice for application** / Retarder Auswahl für die Anwendung*

Duty cycle

Industrial application

P1 N°:



Date: _____

Order Form

Customer number: _____

Shipment Number: _____

Application Data	
Vehicle year / make / model	
Wheelbase	
GVW	
Axle Ratio	
Tire Size	
Driveline Series	
Transmission make / model	
Axle make / model	
End User/Vocation	
Alternator/Batteries	
Telma Control System (foot / hand / dual)	

Bill to:				Ship to:			
Company				Company			
Address				Address			
City				City			
State		Zip		State		Zip	
Phone				Phone			
Attention				Attention			

Customer P. O.	Date Needed	Shipment Date	Ship Via	Ordered By

			Net price	
Qty	Telma Part Number	DESCRIPTION	Price each	Price Total

Special Instructions:	
Approval for Telma model and Installation Kit:	Date:

Please attach customer purchase order