
Precision Auger Pump User Guide

Version 2.5
December 27, 2019
Part No. 22200606

for use with:

PN 22293187-0001 - Precision Auger Pump, Configuration 1
PN 22293187-0002 - Precision Auger Pump, Configuration 2
PN 22293187-0003 - Precision Auger Pump, Configuration 3
PN 22293187-0004 - Precision Auger Pump, Configuration 4
PN 22293187-0006 - Precision Auger Pump, Configuration 6
PN 22293187-0007 - Precision Auger Pump, Configuration 7
PN 22293187-0008 - Precision Auger Pump, Configuration 8
PN 22293187-0009 - Precision Auger Pump, Configuration 9
PN 22293187-0010 - Precision Auger Pump, Configuration 10
PN 22293187-0011 - Precision Auger Pump, Configuration 11



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Introduction to Precision Auger Pump

The Precision Auger pump provides excellent dispense control and repeatability. The pump is available in a heated or non-heated configuration. Pump heating is monitored through a closed loop system.

Auger motion is controlled by an encoded motor. Interface with GPD FLOWare® control software for full control of auger motion, acceleration, deceleration, maximum speed, and number of encoder counts for small dispenses.

Applications

The GPD Global Precision Auger pump dispensing pump is ideal for high quantity applications in electronics assembly, and medical device and industrial assembly markets. Some of the applications for which this pump excels:

- encapsulations,
- underfill,
- RTV,
- re-agents,
- thermal greases,
- industrial lubes,
- and many others.

Cartridge System

The auger cartridge assembly is available in three different flow rate diameters. The auger is available with different cuts and a relieved OD to accommodate filled materials.



062	Ultra low quantity
105	Standard quantity
186	Large quantity

Needles

The Auger Cartridge assembly accommodates a GPD proprietary Precision Needle available in 15G to 32G sizes. These high flow rate needles have internal geometry features that improve dispense capability. An adapter makes standard Luer needles compatible with the pump.

Install Pump

DS Series or MAX Series

To install pump on a GPD Global DS Series or MAX Series system:

1. Mount pump in CycDog mount:
 - a. Press down and hold the latching lever at the top of the mount.
 - b. Align and engage the pump with the top dowel pin of the mount.
 - c. Apply downward pressure to the pump while releasing the latching lever.
2. Mount material on the pump.
3. Plug the pump power and encoder cables into the appropriate pair of receptacles at the base of the dispensing system Z-axis motor cover.
4. Plug the syringe air hose into the appropriate air receptacle.

Island Series

To install pump on a GPD Global Island Series system:

1. Turn OFF the Precision Auger pump controller.
2. Mount the pump in the CycDogmount:
 - a. Press down and hold the latching lever at the top of the mount.
 - b. Align and engage the pump with the top dowel pin of the mount.
 - c. Apply downward pressure to the pump while releasing the latching lever.
3. Mount material on the pump.
4. Connect the pump to the Island Series interconnect panel:
 - a. Plug the pump power and encoder cables into the Precision Auger pump controller.
 - b. Plug the syringe air hose into the air receptacle.

Non-GPD Equipment

To mount a GPD pump on non-GPD hardware:

1. Prepare your hardware to accept the CycDog™ Mount hardware. For hole pattern and dimension details, refer to [22110291 Taper-Lock Mounting Detail](#) (pg 28).
2. Fasten the CycDog to your hardware.
3. Mount the pump in the CycDog:
 - a. Press down and hold the latching lever at the top of the mount.
 - b. Align and engage the pump with the top dowel pin of the mount.
 - c. Apply downward pressure to the pump while releasing the latching lever.

Operations

Tips about Syringe Pressure

Material in the syringe is continuously pressurized to provide a steady supply of material to the auger.

Most materials require 1 to 20 PSI to maintain a full dispensing pump. The pump relies on air pressure to provide a consistent supply of fluid to the pump resulting in consistent dispensing. When activated, the motor rotates, moving material through the dispensing pump to mechanically dispense the material.

- Syringe pressure should be as low as possible while still providing a consistent supply of fluid to the pump.
- If too little air syringe pressure is applied, inconsistent dispensing, such as line breaks or non-repeatable dots, will occur.
- If too much air syringe pressure is applied, materials tend to compact. If this occurs, material will clog the auger and/or the needle. Applying too much air pressure can also cause bleeding from the dispense tip when the machine is idle between dispense operations.
- Forcing materials through the auger may cause material to back up into the needle hub. If this occurs, the material will compact inside the needle and auger.

Purging Auger Cartridge Assembly

1. If the needle is installed, remove it and set it aside.
2. With the material attached to the Luer-Lok adapter on the dispense tube assembly:
 - a. Turn the air pressure up to approximately 10 PSI.
 - b. Note the material migrating down the clear feed tube into the cartridge.
 - c. When the material reaches the cartridge, wait a few seconds until it fills around the auger and then cycle the pump, rotating the auger continuously until material starts to dispense out the end of the cartridge.
 - d. Allow material to dispense for approximately 10 seconds.
 - e. Stop the dispense cycle and wipe the end of the auger cartridge clean.
 - f. Cycle the pump again for 5 to 10 seconds.
 - g. Wipe the end of the auger cartridge clean.
3. Install the needle to the cartridge, locking it in place with the nozzle lock nut.
4. Cycle the pump until material dispenses from the needle tip.
 - a. Let material dispense for approximately 15 to 30 seconds or until it dispenses consistently.
 - b. Continue this process until consistent dispensing is achieved with the lowest possible air syringe pressure.

NOTE: Some materials requires as little as 2 PSI.

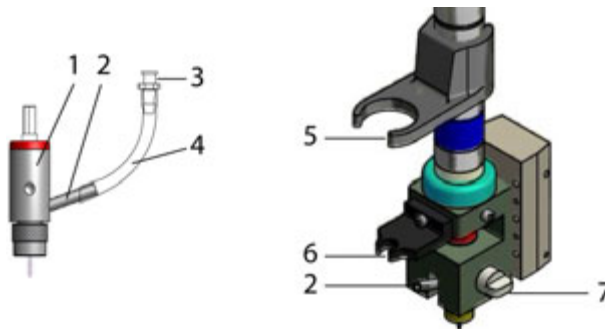
NOTE: Material bleeding out of the needle while in a non-dispense mode indicates trapped air. Continue to purge material from the pump until bleeding stops.

NOTE: If air syringe pressure is set too high, material may bleed out the needle after the dispense cycle has stopped. Turn down air syringe pressure in small increments, letting the air syringe pressure stabilize for about 30 seconds. Cycle the dispense pump.

5. The dispense pump is now ready for dispensing.

Disassemble Pump

Remove Dispense Tube & Cartridge



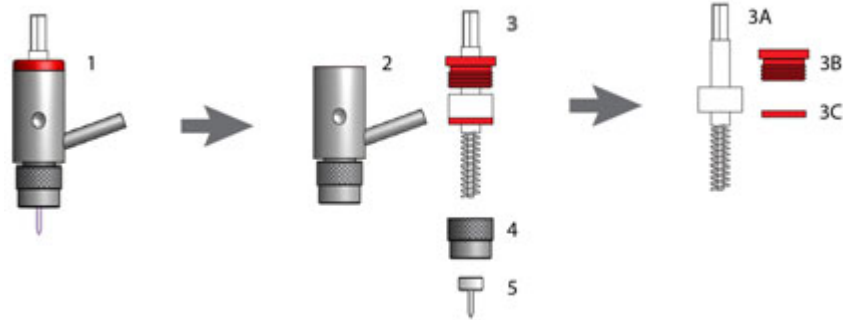
1	cartridge
2	cartridge feed tube
3	Luer-Lok adapter
4	dispense tube
5	syringe support
6	syringe nose support
7	thumb knob

1. Unscrew the material syringe (not shown) from the Luer-Lok Adapter, and then slide it up and out of the Syringe Support.
2. Gently pull the Dispense Tube out of the Syringe Nose Support.
3. Loosen the Thumb Knob and then slide the Cartridge out of the pump housing.
4. Remove the Dispense Tube from the Cartridge Feed Tube by pinching the base of the Cartridge Feed Tube with one hand while gently pulling the Dispense Tube straight away with the other hand.

NOTE: Do not pull the Dispense Tube at an angle to the Cartridge Feed Tube or damage to the Cartridge Feed Tube may result.

NOTE: After cleaning the Cartridge, always replace the Dispense Tube with a new one.

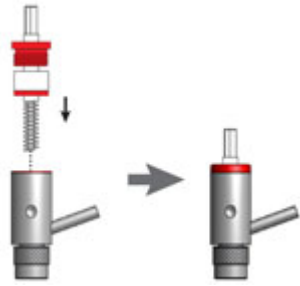
Disassemble Cartridge & Auger Assemblies



1	auger cartridge assembly with needle
2	cartridge body
3	auger with spanner nut & washer
3A	auger
3B	spanner nut
3C	washer
4	nozzle lock nut
5	needle

1. To disassemble the Auger Cartridge assembly:
 - a. Rotate the Nozzle Lock Nut counterclockwise until it is free from the Cartridge body. The Needle should separate from the Cartridge body inside the Nozzle Lock Nut. If not, remove the Nozzle Lock Nut from the end of the Cartridge body.
 - b. Hold the Nozzle Lock Nut in one hand with the Needle tip facing up while the backside is facing the palm of your other hand. Remove the Needle from the Nozzle Lock Nut by gently pushing on the Needle tip with your thumb. The Needle should separate from the Nozzle Lock Nut freely, falling into the palm of your hand.
 - c. Rotate the Spanner Nut counterclockwise with the spanner nut wrench until it is free from the Cartridge body.
 - d. Lift the Auger straight up and out of the Cartridge body.
2. To disassembly the Auger assembly:
 - a. Remove the Spanner Nut and Washer from the Auger.
 - b. Set components aside for cleaning.

Reassemble Pump



1. Insert the Auger, Spanner Nut, and Washer assembly into the Cartridge body.

NOTE: Take care not to damage the end of the Auger on the carbide sleeve installed in the Cartridge.

2. Tighten the Spanner Nut with the spanner nut wrench, rotating the Spanner Nut clockwise until snug.

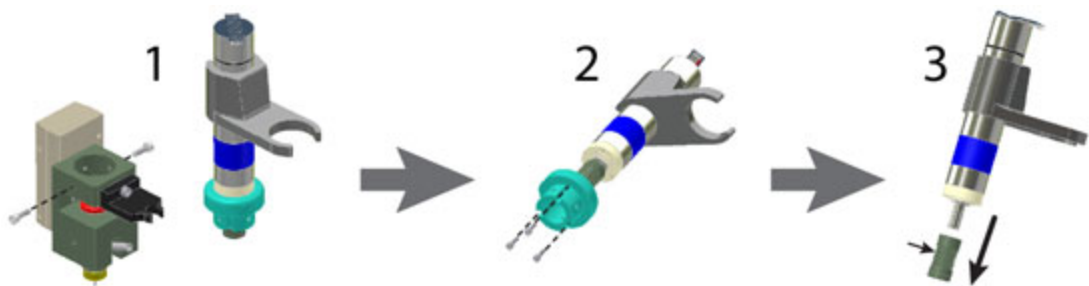
NOTE: Do not over tighten the Spanner Nut or the Auger will not rotate freely.

3. The Auger should rotate freely in the completed assembly. Inspect the Auger to ensure it rotates freely before installing the Cartridge Assembly into the pump.

CAUTION: If the Auger does not rotate freely, disassemble and inspect all parts to verify they are clean, and then reassemble.

4. Purge the Auger Cartridge assembly. Details at [Purging Auger Cartridge Assembly](#) (pg 3).

Replace Coupler



1. Remove two screws and then separate the Motor/Motor Adapter from the pump housing.
2. Remove three screws and then separate the Motor Adapter from the Motor.
3. Loosen the Coupler Set Screw and then slide the coupler off the Motor.
4. Slide a new coupler onto the Motor and tighten the Coupler Set Screw.
5. Slide the Motor Adapter onto the Motor and fasten in place.
6. Set the Motor/Motor Adapter in the pump housing and fasten in place.

Maintenance

DAILY - Use the appropriate support kit to clean pump auger and needle - see [Pump Support Kits](#) (pg 7). As needed, [Lubricate Auger](#) (pg 10).

Maintenance recommendations are based on 40 to 60 hours of run time per week. The following suggested schedule should be altered to accommodate your particular process requirements. A record of the maintenance performed should be maintained.

Pump Support Kits

REQUIRED: Precision Auger pump Pump Support Kit.

Use the support kit appropriate for your pump cartridge:

Cartridge Size	Nozzle Type	Pump Support Kit
.186 diameter	Precision	PN 22142053
	Luer	PN 22142071
.105 diameter	Precision	PN 22142054
	Luer	PN 22141056
.062 diameter	Precision	PN 22142054
	Luer	PN 22141056

NOTE: Kit contents are illustrated in *KITS: Spare Parts/Setup/Cleaning* (PN 22290036).

Clean Pump Components

NOTE: Alcohol is the recommended cleaning solvent for these cleaning procedures. See appropriate personnel at your facility for proper care, handling, and disposal.

To clean pump:

1. [Disassemble Pump](#) (pg 4).
2. Clean the Auger Cartridge assembly:
 - a. Clean the Auger. Remove all materials from the Auger screw and wipe dry.
 - b. Clean the Spanner Nut and Washer. Remove all materials from both and wipe dry.
 - c. Perform [Clean Cartridge Body](#) (pg 8) and [Clean Dispense Needle](#) (pg 9) procedures.

Cleaning Demonstration

*How to Clean Auger Cartridge Assembly & FPC Module**



**the optional FPC module may not be present on your pump.*

3. [Reassemble Pump](#) (pg 6).

Clean Cartridge Body



1	top side of cartridge body
2	material cavity
3	material inlet tube
4	needle end of Cartridge body

NOTE: Remove all material from both inside and outside of the Cartridge body. Clean the Cartridge body using one of these methods:

Method 1

1. Insert a pathway cleaner into the top side of the Cartridge body, stopping just above the Material Inlet Tube.

2. Insert a second pathway cleaner into the Material Inlet Tube. Push the pathway cleaner, driving material into the Material Cavity.
3. Push the first pathway cleaner (already inserted into Cartridge) all the way through the Material Cavity.
4. Repeat the above process as many times as needed until the pathway cleaners remain clean.

Method 2

1. Flush out the Cartridge body using a suitable solvent to ensure Cartridge body is totally clean.
2. Wet the brushes with solvent and brush in and out through the Material Inlet Tube and Material Cavity.
3. Flush and repeat the cleaning process several times until the Cartridge body is completely clean.
4. Use the cleaning brushes to remove and clean all materials from the Needle end of the Cartridge body.
5. Flush thoroughly and dry.

Clean Dispense Needle

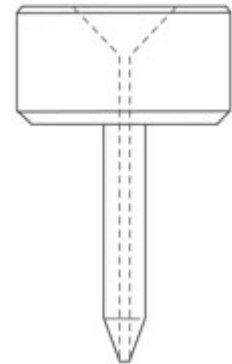
1. Insert the drill end of the pilot cleaning tool into the pin vise with at least 1/2 inch of the drill extended.

NOTE: Do not apply excess pressure to the needle with the drill or needle damage will result.

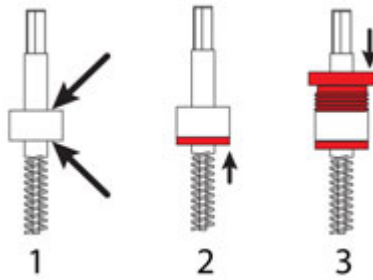
2. Insert the tool into the backside of the needle.
3. Rotate the drill in a clockwise direction to remove dispensing material. Clean the tool after each attempt to remove material. Repeat this process several times.
4. Using the altered end of the pilot cleaning tool extended out of the pin vise at least 1/2 inch, insert the tool into the backside of the needle.
5. Rotate the tool clockwise while cleaning the tool after each attempt to remove material. Repeat several times.
6. Run the applicable gauge of cleaning wire through the needle to remove the material in the needle tip area.

NOTE: All material must be removed from inside and outside of the needle

7. Flush the needle in alcohol and repeat the above process until the needle is totally clean.



Lubricate Auger



1. Apply a small amount of Teflon grease on areas indicated.
2. Slide the Washer onto the Auger, placing it against the auger collar and rotating the Washer to evenly displace grease between both surfaces.
3. Slide the Spanner Nut onto the Auger, placing it against the auger collar and rotating the Spanner Nut to evenly displace grease between both surfaces.

Troubleshooting

If the heater in a heated pump model needs to be replaced, order the appropriate heater and grease, and then follow the replacement instructions. Part number and instruction details are noted on the pump drawings:

- [22293187-0003 Precision Auger pump - Servo Motor, Heated, 2 Connectors](#) (pg 17)
- [22293187-0004 Precision Auger pump - Servo Motor, Heated 140° C, 2 Connectors](#) (pg 18)

Parts Lists

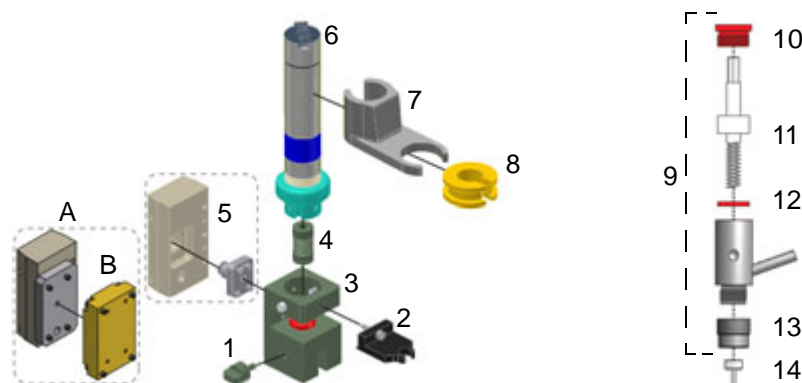


Table 1: Consumable Parts

Image Item No.	Description	Qty.	Part Numbers by Cartridge Diameter		
			Large Quantity 186	Standard Quantity 105	Ultra Low Quantity 062
-	Kit, Pump Support Pump Support Kit - Precision style (186)* Pump Support Kit - Precision style (105/062)* Pump Support Kit - Luer style (186) Pump Support Kit - Luer style (105/062)	1	22142053 22142071	22142054 22141056	
-	Feed Tube * Cartridge diameter 186, Tygon Cartridge diameter 186, Tygon, UV (optional) Cartridge diameter 105/062, Tygon	1	22110463 22110304		22110064
-	Pathway Cleaners *	1 pkg		10/3900	
-	Cleaning Brushes, Spiral, 5/32	1		10/4155	
-	Cleaning Brushes, Spiral, 3/16	1		10/4162	
14	Needle	1	See Auger & Cartridge Parts (pg 13)		
-	Cleaning Brushes, 1/4" *	1		10/4775	
-	Teflon/Dielectric Grease *	1		10/4767	
-	Teflon Oil*	1		10/3432	
-	Cotton Swabs* Cotton Swabs, standard Cotton Swabs, small diameter, round Cotton Swabs, small diameter, pointed	1		10/3473 10/4879 10/4878	

*included in [Pump Support Kits](#) (pg 7).

Table 2: Spare Parts

Image Item No.	Description	Qty.	Part Numbers by Cartridge Diameter		
			Large Quantity 186	Standard Quantity 105	Ultra Low Quantity 062
-	Kit, Pump Support Pump Support Kit - Precision style (186)* Pump Support Kit - Precision style (105/062)* Pump Support Kit - Luer style (186) Pump Support Kit - Luer style (105/062)	1	22142053 22142071	22142054 22141056	
4	Precision Auger Coupler, 156 Hex	1		D1528	
1	Thumb Knob Non-heated version, Turcite Heated version	1		22142036 22142007	
10	Spanner Nut, 154 Hex Non-heated version Heated version, Torlon	1		22142005 22142070	

Table 2: Spare Parts

Image Item No.	Description	Qty.	Part Numbers by Cartridge Diameter		
			Large Quantity 186	Standard Quantity 105	Ultra Low Quantity 062
12	Washer Non-heated version, Turcite Heated version, Torton	1	22142004 22142069	22142057 Call GPD.	22142068 Call GPD.
13	Nozzle Lock Nut Large Hub Nozzle Small Hub Nozzle Reduced Diameter for Small Hub (0.390 O.D.)	1	22140043 22141073		
			N/A	22141084	
8	Bushing For 3 cc syringe For 5 cc syringe For 10 cc syringe	1	22141041 22141042 22141043		

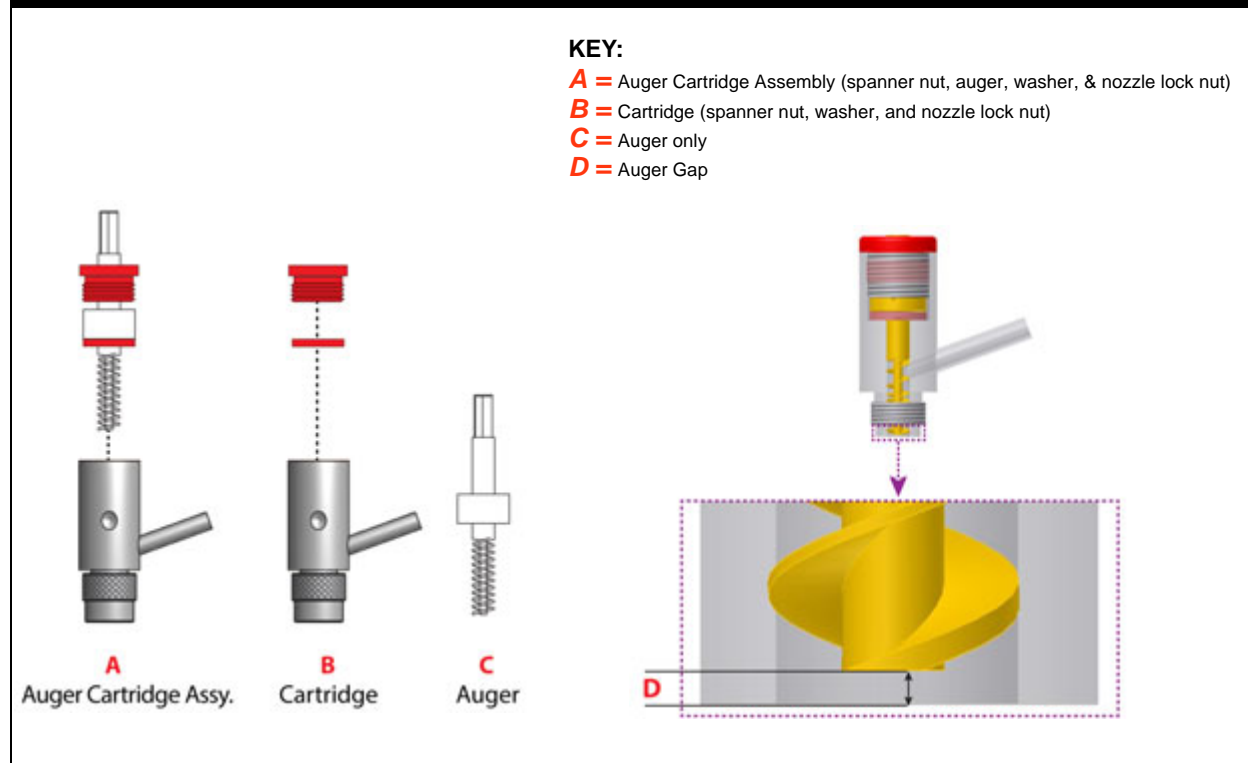
Table 3: General Parts

Image Item No.	Description	Qty.	Part Numbers by Cartridge Diameter		
			Large Quantity 186	Standard Quantity 105	Ultra Low Quantity 062
1-7	Precision Auger Pump with Taper Lock Mount	1	22142063		
11	Auger	1	See Auger & Cartridge Parts (pg 13)		
9	Auger Cartridge Assembly	1			
7	Syringe Support	1	22203611		
2	Syringe Nose Support	1	22503016	22203656	
6	Motor (motor interface not included)	1	3500-0094		
3, 5 (A,B)	Body and standard adapter Heater adapter and heater (optional)	1	22142037 Call GPD for part number.		

Auger & Cartridge Parts

Table 4: Auger & Cartridge Descriptions, Dimensions, & Part Numbers

Description	Part No.			Auger Gap (inch)	Notes
	A Auger Cartridge Assembly	B Cartridge	C Auger		
LARGE QUANTITY DIAMETER (186) with 154 Hex					
186 Standard	22142012		22142015		
186 Standard, DP	22142014		22142016		
186 Standard, UD	22142011	22142010	22141060	0.0235 - 0.025	
186 Standard, UD, Relieved	22141063		22141062		Relief per side 0.04318 mm (0.0017")
186 Deep, Relieved	-		22141076		
STANDARD QUANTITY DIAMETER (105) with 154 Hex					
105, 16P Standard	22144003		22144004		
105, 16P Shallow	22144005	22142041	22144009	0.0015 - 0.003	
105, 16P Deep	22144019		22144020		
105, 32P Standard	-		22144001		
ULTRA LOW QUANTITY DIA. (062) with 154 Hex					
062, 32P STD	22144010	22144008	22144002		
062, 48P STD	22144006		22144007	0.0015 - 0.003	



Specifications

Dimensions* (W x D x H) 57.15 mm x 76.2 mm x 190.5 mm (2.25" x 3" x 7.5")
 Contact GPD Global for 3D models for integration layout purposes.
 Cable length 279.4 mm (11")

* For additional dimensions, refer to [Dimensioned Drawings](#) (pg 14).

Capacities

Smallest shot size by cartridge diameter: *

062 cartridge 0.5 nl

105 cartridge 3.4 nl

186 cartridge 65.0 nl

**Actual minimum quantity can vary depending on fluid properties.*

Contact GPD Global for actual minimum for your fluid.

Nozzle types Precision or Luer

Viscosity range by pump configuration:

Standard 8,000 to 500K+ cps

High temperature 300,000+ cps

Wetted Materials Carbide, Stainless Steel

Temperature range for heated pump configurations by pump part number:

22293187-0003 ambient to 100° C (212° F)

40W Kapton heater and copper cartridge

22293187-0004 ambient to 130° C (266° F)

Controls:

Encoder counts 27,136 counts per 360° revolution

Motor rotation counterclockwise

References

Mechanical Drawings

- [22293187-0001 Precision Auger pump - Servo Motor, 2 Connectors](#) (pg 15)
- [22293187-0002 Precision Auger pump - Servo Motor, Ball Lock](#) (pg 16)
- [22293187-0003 Precision Auger pump - Servo Motor, Heated, 2 Connectors](#) (pg 17)
- [22293187-0004 Precision Auger pump - Servo Motor, Heated 140° C, 2 Connectors](#) (pg 18)
- [22293187-0006 Precision Auger pump - Servo Motor](#) (pg 20)
- [22293187-0007 Precision Auger pump - Servo Motor Housing](#) (pg 22)
- [22293187-0008 Precision Auger pump - Servo Motor Housing, Offset](#) (pg 24)
- [22293187-0009 Precision Auger pump - Servo Motor, Heated](#) (pg 25)
- [22293187-0010 Precision Auger pump - Servo Motor, Heated 140° C](#) (pg 26)
- [22293187-0011 Precision Auger pump - Servo Motor, 22" Cable](#) (pg 27)

Dimensioned Drawings

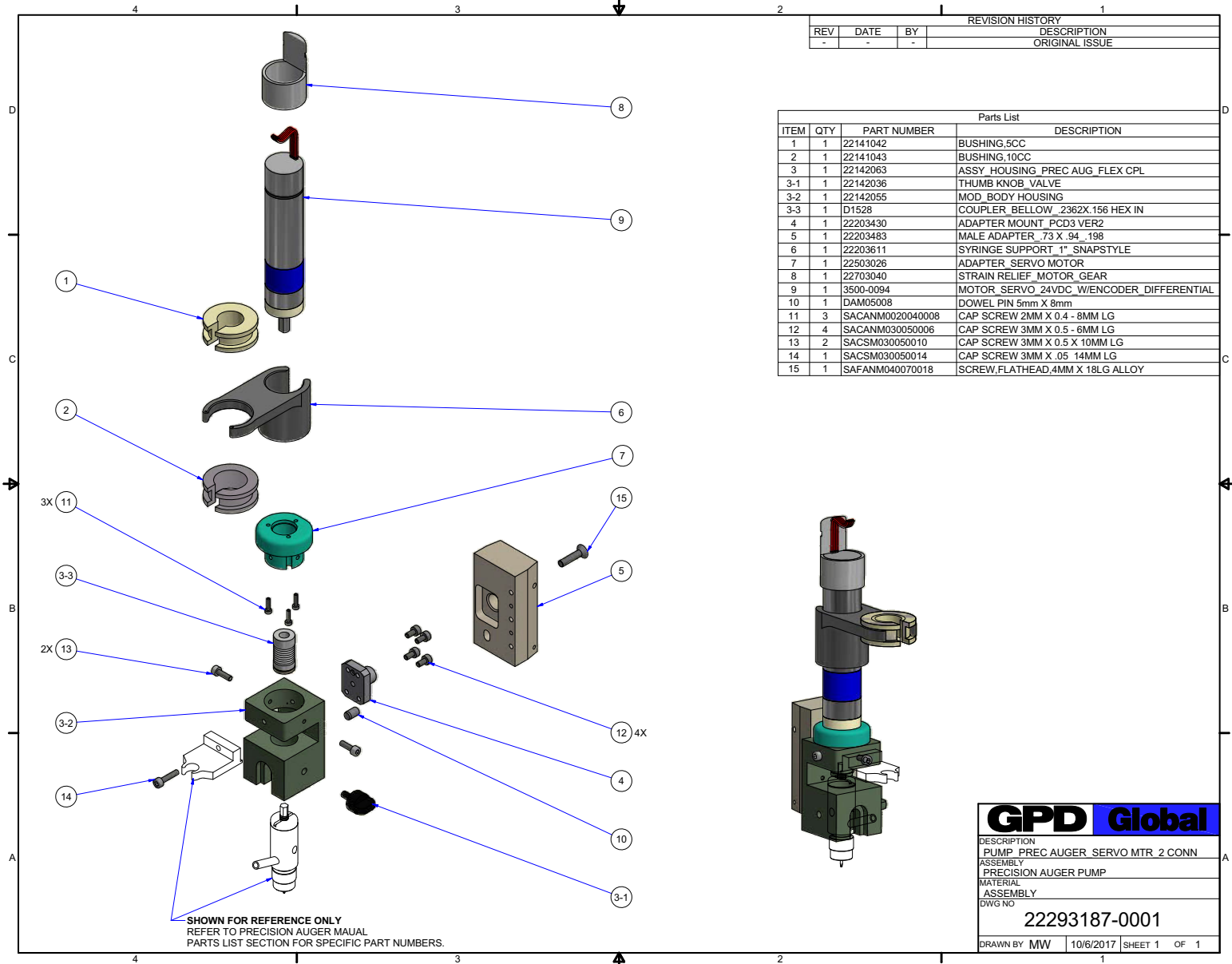
Non-Heated. [22293187-0006 Dimensions for All Non-Heated Models](#) (pg 21)

Heated. [22293187-0004 Dimensions for All Heated Models](#) (pg 19)

Heated/Enclosed Motor. [22293187-0007 Dimensions for All Heated/Enclosed Motor Models](#) (pg 23)

Taper-Lock Mount. [22110291 Taper-Lock Mounting Detail](#) (pg 28)

22293187-0001 Precision Auger pump - Servo Motor, 2 Connectors



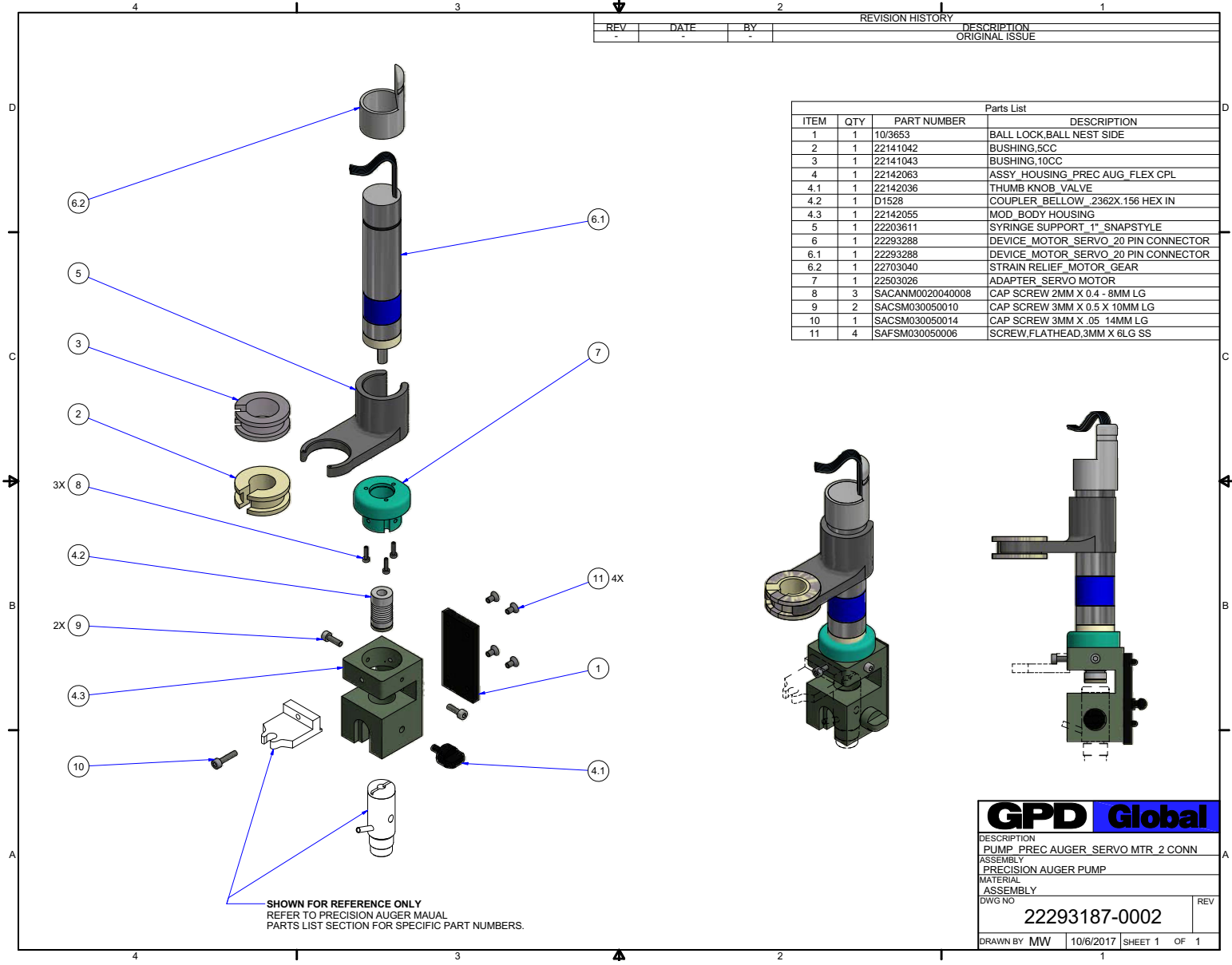
SHOWN FOR REFERENCE ONLY
REFER TO PRECISION AUGER MAUAL
PARTS LIST SECTION FOR SPECIFIC PART NUMBERS.

REV			DATE		BY		REVISION HISTORY	
-	-	-	-	-	-	-	DESCRIPTION	ORIGINAL ISSUE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22141042	BUSHING,5CC
2	1	22141043	BUSHING,10CC
3	1	22142063	ASSY_HOUSING_PREC AUG_FLEX CPL
3-1	1	22142036	THUMB KNOB_VALVE
3-2	1	22142055	MOD_BODY HOUSING
3-3	1	D1528	COUPLER BELLOW_2362X.156 HEX IN
4	1	22203430	ADAPTER MOUNT_PCD3 VER2
5	1	22203483	MALE ADAPTER_.73 X .94_.198
6	1	22203611	SYRINGE SUPPORT_1" SNAPSTYLE
7	1	22503026	ADAPTER_SERVO MOTOR
8	1	22703040	STRAIN RELIEF MOTOR_GEAR
9	1	3500-0094	MOTOR_SERVO 24VDC W/ENCODER DIFFERENTIAL
10	1	DAM05008	DOWEL PIN 5mm X 8mm
11	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
12	4	SACANM030050006	CAP SCREW 3MM X 0.5 - 6MM LG
13	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
14	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG
15	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY

GPD Global	
DESCRIPTION	
PUMP PREC AUGER SERVO MTR 2 CONN	
ASSEMBLY	
PRECISION AUGER PUMP	
MATERIAL	
ASSEMBLY	
DWG NO	
22293187-0001	
DRAWN BY	MW
DATE	10/6/2017
SHEET	1 OF 1

22293187-0002 Precision Auger pump - Servo Motor, Ball Lock



REVISION HISTORY				DESCRIPTION
REV	DATE	BY		ORIGINAL ISSUE

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10/3653	BALL LOCK,BALL NEST SIDE
2	1	22141042	BUSHING,6CC
3	1	22141043	BUSHING,10CC
4	1	22142063	ASSY HOUSING_PREC AUG_FLEX CPL
4.1	1	22142036	THUMB KNOB_VALVE
4.2	1	D1528	COUPLER_BELLOW_2362X.156 HEX IN
4.3	1	22142055	MOD_BODY HOUSING
5	1	22203611	SYRINGE SUPPORT_1" SNAPSTYLE
6	1	22293288	DEVICE_MOTOR_SERVO_20 PIN CONNECTOR
6.1	1	22293288	DEVICE_MOTOR_SERVO_20 PIN CONNECTOR
6.2	1	22703040	STRAIN RELIEF_MOTOR_GEAR
7	1	22503026	ADAPTER_SERVO MOTOR
8	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
9	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
10	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG
11	4	SAFSM030050006	SCREW,FLATHEAD,3MM X 6LG SS

SHOWN FOR REFERENCE ONLY
REFER TO PRECISION AUGER MAUAL
PARTS LIST SECTION FOR SPECIFIC PART NUMBERS.

GPD Global

DESCRIPTION
PUMP_PREC AUGER_SERVO MTR_2 CONN

ASSEMBLY
PRECISION AUGER PUMP

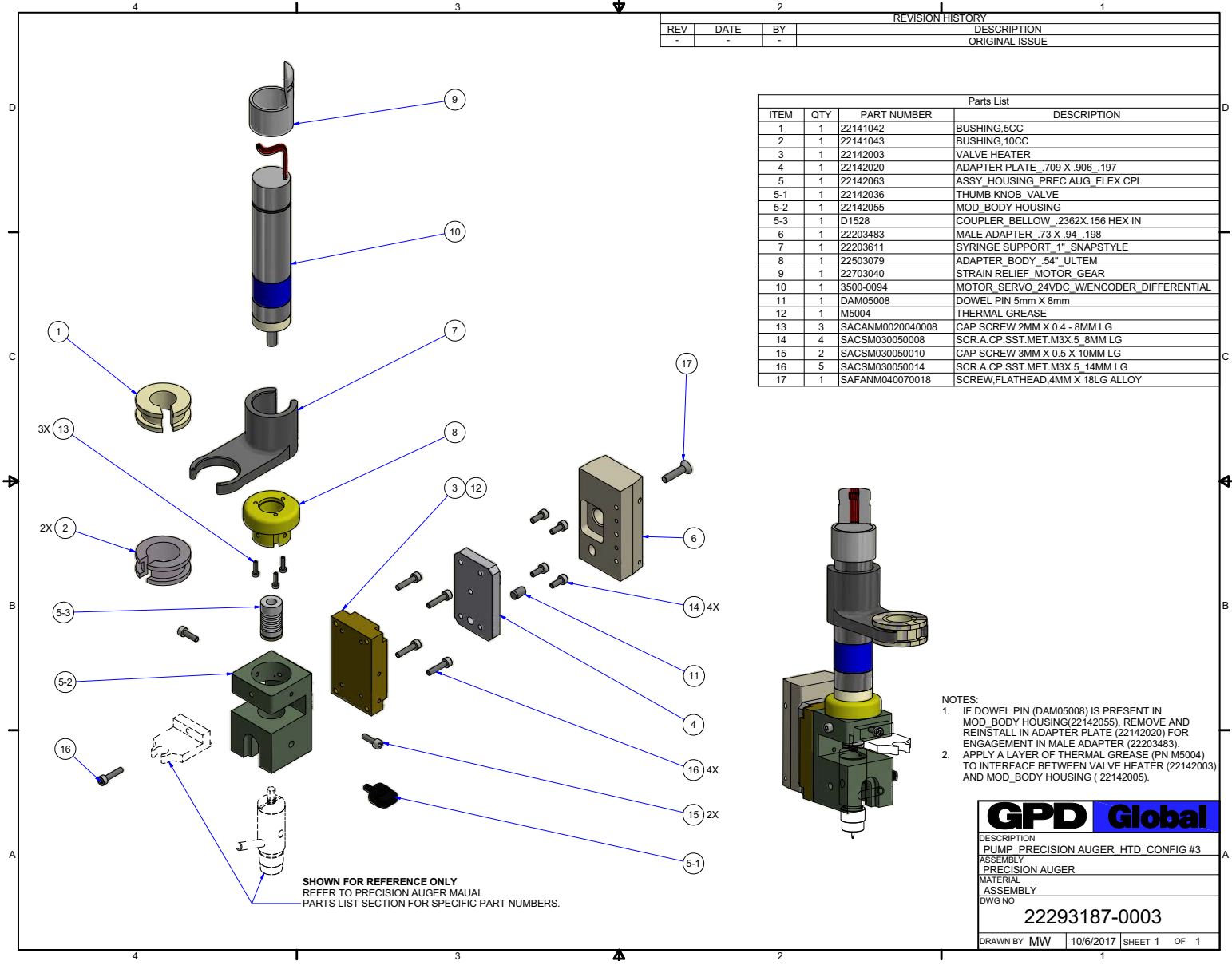
MATERIAL
ASSEMBLY

DWG NO
22293187-0002

REV

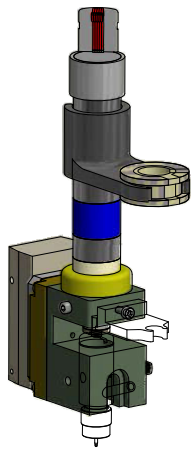
DRAWN BY MW 10/6/2017 SHEET 1 OF 1

22293187-0003 Precision Auger pump - Servo Motor, Heated, 2 Connectors



REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	ORIGINAL ISSUE

Parts List				
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	22141042	BUSHING,5CC	
2	1	22141043	BUSHING,10CC	
3	1	22142003	VALVE HEATER	
4	1	22142020	ADAPTER PLATE ,709 X .906 ,.197	
5	1	22142063	ASSY HOUSING PREC AUG_FLEX CPL	
5-1	1	22142036	THUMB KNOB_VALVE	
5-2	1	22142055	MOD_BODY HOUSING	
5-3	1	D1528	COUPLER_BELLOW ,.2362X.156 HEX IN	
6	1	22203483	MALE ADAPTER ,.73 X .94 ,.198	
7	1	22203611	SYRINGE SUPPORT_1" SNAPSTYLE	
8	1	22503079	ADAPTER_BODY ,.54" ULTEM	
9	1	22703040	STRAIN RELIEF_MOTOR_GEAR	
10	1	3500-0094	MOTOR_SERVO_24VDC_W/ENCODER DIFFERENTIAL	
11	1	DAM05008	DOWEL PIN 5mm X 8mm	
12	1	M5004	THERMAL GREASE	
13	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG	
14	4	SACSM030050008	SCRA.CP.SST.MET.M3X.5 8MM LG	
15	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG	
16	5	SACSM030050014	SCRA.CP.SST.MET.M3X.5 14MM LG	
17	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY	

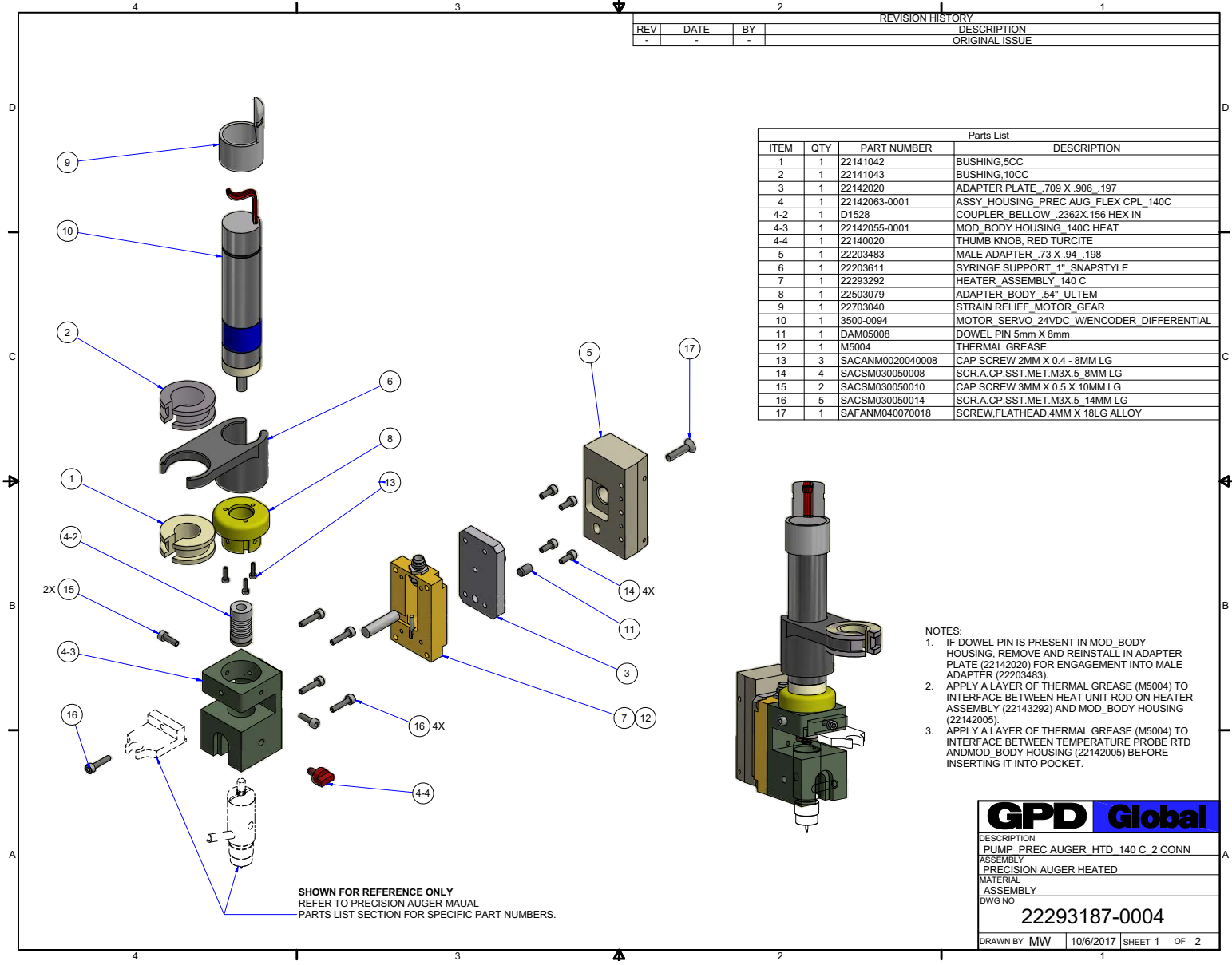


- NOTES:
- IF DOWEL PIN (DAM05008) IS PRESENT IN MOD_BODY HOUSING(22142055), REMOVE AND REINSTALL IN ADAPTER PLATE (22142020) FOR ENGAGEMENT IN MALE ADAPTER (22203483).
 - APPLY A LAYER OF THERMAL GREASE (PN M5004) TO INTERFACE BETWEEN VALVE HEATER (22142003) AND MOD_BODY HOUSING (22142005).

GPD Global			
DESCRIPTION			
PUMP PRECISION AUGER HTD CONFIG #3			
ASSEMBLY			
PRECISION AUGER			
MATERIAL			
ASSEMBLY			
DWG NO			
22293187-0003			
DRAWN BY	MW	10/6/2017	SHEET 1 OF 1

SHOWN FOR REFERENCE ONLY
REFER TO PRECISION AUGER MAUAL
PARTS LIST SECTION FOR SPECIFIC PART NUMBERS.

22293187-0004 Precision Auger pump - Servo Motor, Heated 140° C, 2 Connectors



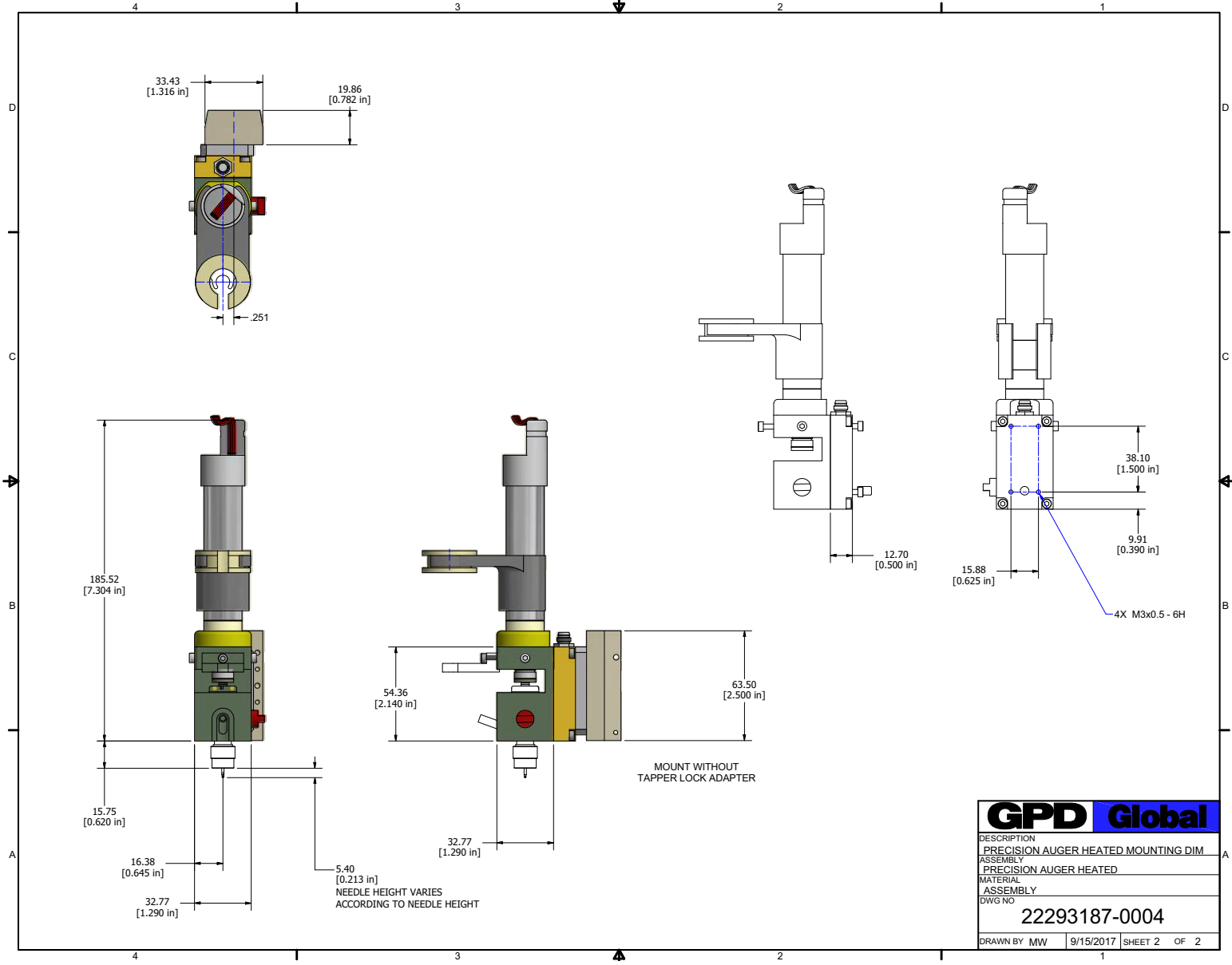
REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	ORIGINAL ISSUE

Parts List				
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	22141042	BUSHING,5CC	
2	1	22141043	BUSHING,10CC	
3	1	22142020	ADAPTER PLATE .709 X .906 .197	
4	1	22142063-0001	ASSY HOUSING PREC AUG FLEX CPL 140C	
4-2	1	D1528	COUPLER BELLOW .2362X.156 HEX IN	
4-3	1	22142055-0001	MOD_BODY HOUSING 140C HEAT	
4-4	1	22140020	THUMB KNOB, RED TURCITE	
5	1	22203483	MALE ADAPTER .73 X .94 .198	
6	1	22203611	SYRINGE SUPPORT .1" SNAPSTYLE	
7	1	22293292	HEATER ASSEMBLY 140 C	
8	1	22503079	ADAPTER BODY .54" ULTEM	
9	1	22703040	STRAIN RELIEF MOTOR GEAR	
10	1	3500-0094	MOTOR_SERVO_24VDC_W/ENCODER_DIFFERENTIAL	
11	1	DAM05008	DOWEL PIN 5mm X 8mm	
12	1	M5004	THERMAL GREASE	
13	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG	
14	4	SACSM030050008	SCR.A.CP.SST.MET.M3X.5 8MM LG	
15	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG	
16	5	SACSM030050014	SCR.A.CP.SST.MET.M3X.5 14MM LG	
17	1	SAFANM040070018	SCREW.FLATHEAD.4MM X 18LG ALLOY	

- NOTES:**
- IF DOWEL PIN IS PRESENT IN MOD_BODY HOUSING, REMOVE AND REINSTALL IN ADAPTER PLATE (22142020) FOR ENGAGEMENT INTO MALE ADAPTER (22203483).
 - APPLY A LAYER OF THERMAL GREASE (M5004) TO INTERFACE BETWEEN HEAT UNIT ROD ON HEATER ASSEMBLY (22143292) AND MOD_BODY HOUSING (22142005).
 - APPLY A LAYER OF THERMAL GREASE (M5004) TO INTERFACE BETWEEN TEMPERATURE PROBE RTD AND MOD_BODY HOUSING (22142005) BEFORE INSERTING IT INTO POCKET.

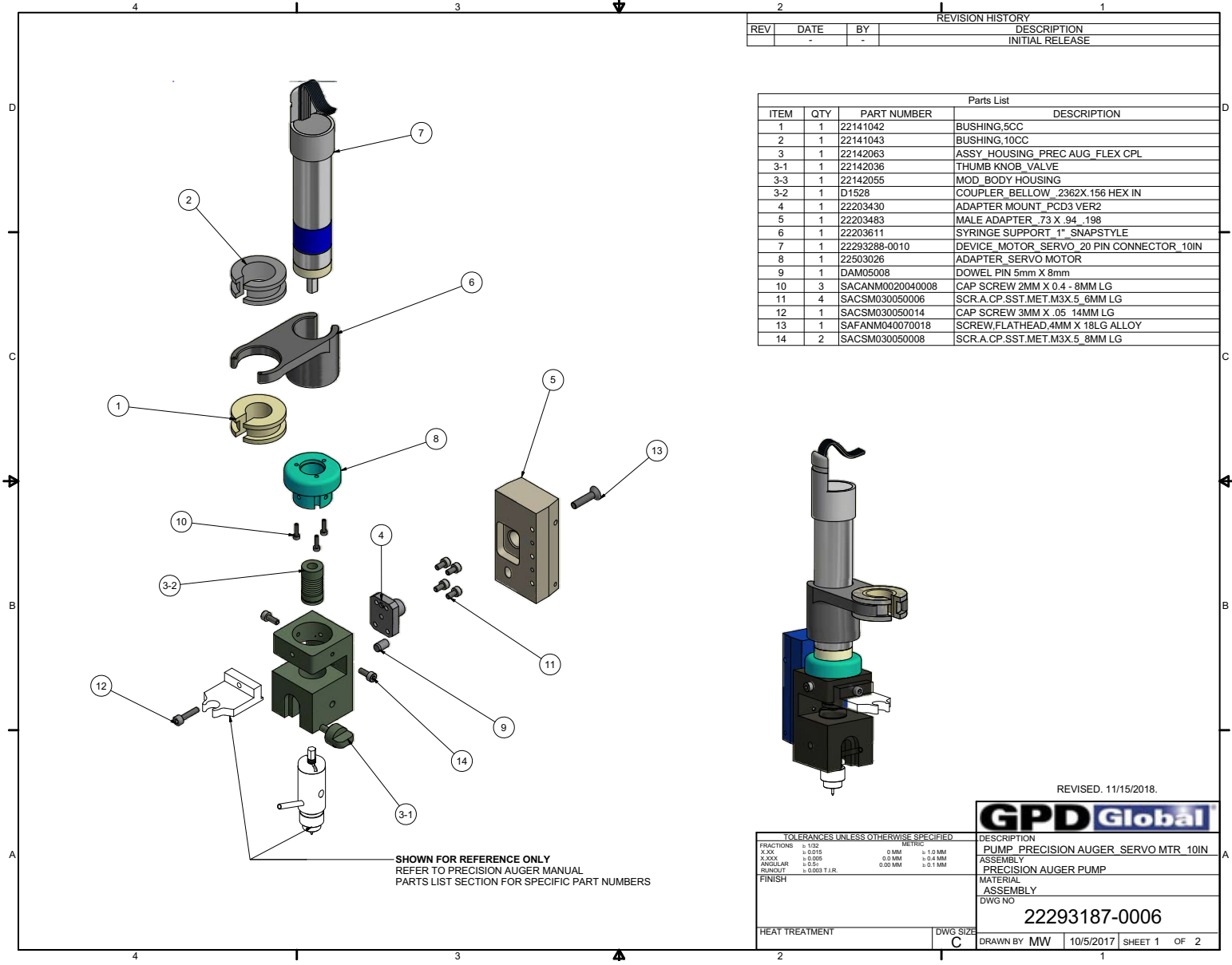
GPD Global	
DESCRIPTION	
PUMP PREC AUGER HTD. 140 C 2 CONN	
ASSEMBLY	
PRECISION AUGER HEATED	
MATERIAL	
ASSEMBLY	
DWG NO	
22293187-0004	
DRAWN BY	MW
DATE	10/6/2017
SHEET	1 OF 2

22293187-0004 Dimensions for All Heated Models



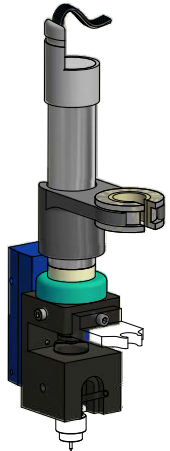
GPD Global		
DESCRIPTION PRECISION AUGER HEATED MOUNTING DIM		
ASSEMBLY PRECISION AUGER HEATED		
MATERIAL ASSEMBLY		
DWG NO 22293187-0004		
DRAWN BY MW	9/15/2017	SHEET 2 OF 2

22293187-0006 Precision Auger pump - Servo Motor



REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	INITIAL RELEASE

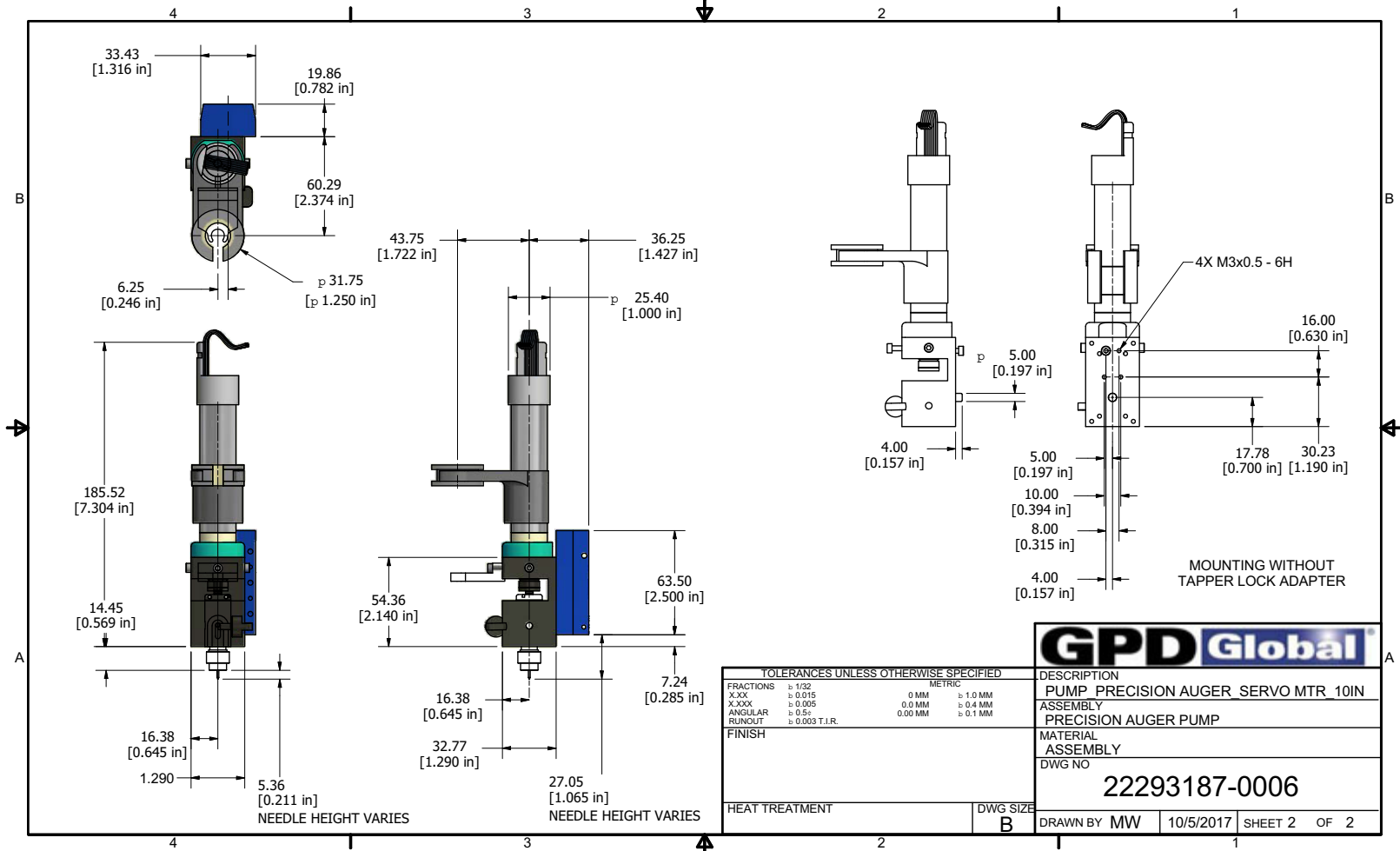
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22141042	BUSHING,5CC
2	1	22141043	BUSHING,10CC
3	1	22142063	ASSY HOUSING PREC AUG FLEX CPL
3-1	1	22142036	THUMB KNOB VALVE
3-3	1	22142055	MOD BODY HOUSING
3-2	1	D1528	COUPLER BELLOW .2362X.156 HEX IN
4	1	22203430	ADAPTER MOUNT_PCD3 VER2
5	1	22203483	MALE ADAPTER .73 X .94 .198
6	1	22203611	SYRINGE SUPPORT 1" SNAPSTYLE
7	1	22293288-0010	DEVICE MOTOR SERVO .20 PIN CONNECTOR 10IN
8	1	22503026	ADAPTER_SERVO MOTOR
9	1	DAM05008	DOWEL PIN 5mm X 8mm
10	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
11	4	SACSM030050006	SCR.A.CP.SST.MET.M3X.5 6MM LG
12	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG
13	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY
14	2	SACSM030050008	SCR.A.CP.SST.MET.M3X.5 8MM LG



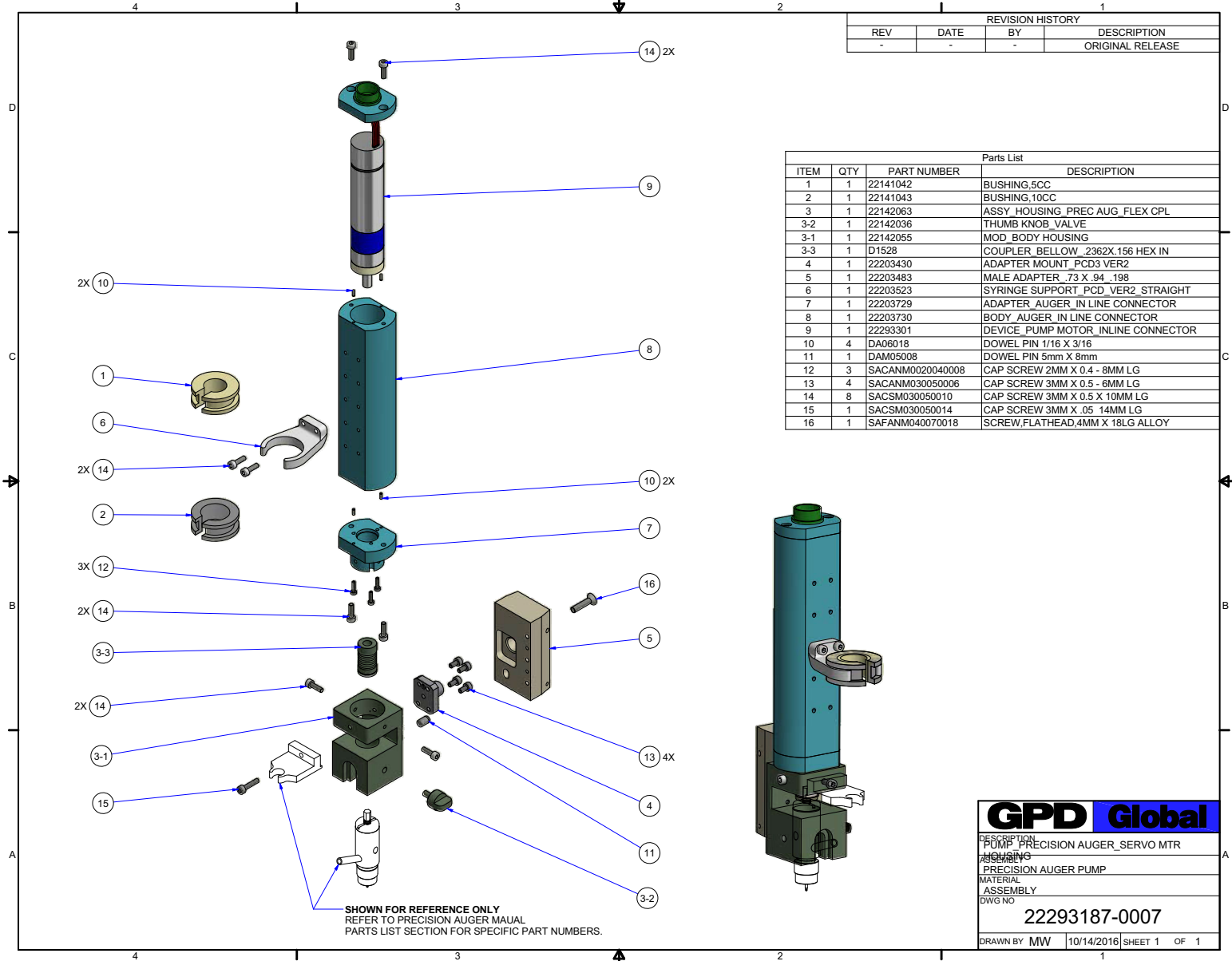
REVISED: 11/15/2018.

<p>TOLERANCES UNLESS OTHERWISE SPECIFIED</p> <p>FRACTIONS = FIVE DECIMALS</p> <p>X.XX = 0.015 0.1MM = 0.1MM</p> <p>X.XXX = 0.005 0.1MM = 0.1MM</p> <p>ANGULAR = 0.5° 0.00MM = 0.1MM</p> <p>RUNDNESS = 0.003 T.R.</p>		<p>DESCRIPTION</p> <p>PUMP PRECISION AUGER SERVO MTR 10IN</p> <p>ASSEMBLY</p> <p>PRECISION AUGER PUMP</p> <p>MATERIAL</p> <p>ASSEMBLY</p> <p>DWG NO</p> <p>22293187-0006</p>
HEAT TREATMENT	DWG SIZE	<p>GPD Global</p> <p>DRAWN BY MW 10/5/2017 SHEET 1 OF 2</p>

22293187-0006 Dimensions for All Non-Heated Models



22293187-0007 Precision Auger pump - Servo Motor Housing



SHOWN FOR REFERENCE ONLY
REFER TO PRECISION AUGER MAUAL
PARTS LIST SECTION FOR SPECIFIC PART NUMBERS.

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	ORIGINAL RELEASE

Parts List				
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	22141042	BUSHING,5CC	
2	1	22141043	BUSHING,10CC	
3	1	22142063	ASSY HOUSING PREC AUG_FLEX CPL	
3-2	1	22142036	THUMB KNOB_VALVE	
3-1	1	22142055	MOD_BODY HOUSING	
3-3	1	D1528	COUPLER_BELLOW_2362X.156 HEX IN	
4	1	22203430	ADAPTER MOUNT_PCD3 VER2	
5	1	22203483	MALE ADAPTER_73 X .94_198	
6	1	22203523	SYRINGE SUPPORT_PCD_VER2_STRAIGHT	
7	1	22203729	ADAPTER_AUGER_IN LINE CONNECTOR	
8	1	22203730	BODY_AUGER_IN LINE CONNECTOR	
9	1	22293301	DEVICE_PUMP MOTOR_INLINE CONNECTOR	
10	4	DA06018	DOWEL PIN 1/16 X 3/16	
11	1	DAM05008	DOWEL PIN 5mm X 8mm	
12	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG	
13	4	SACANM030050006	CAP SCREW 3MM X 0.5 - 6MM LG	
14	8	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG	
15	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG	
16	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY	

GPD Global

DESCRIPTION
PUMP PRECISION AUGER_SERVO MTR

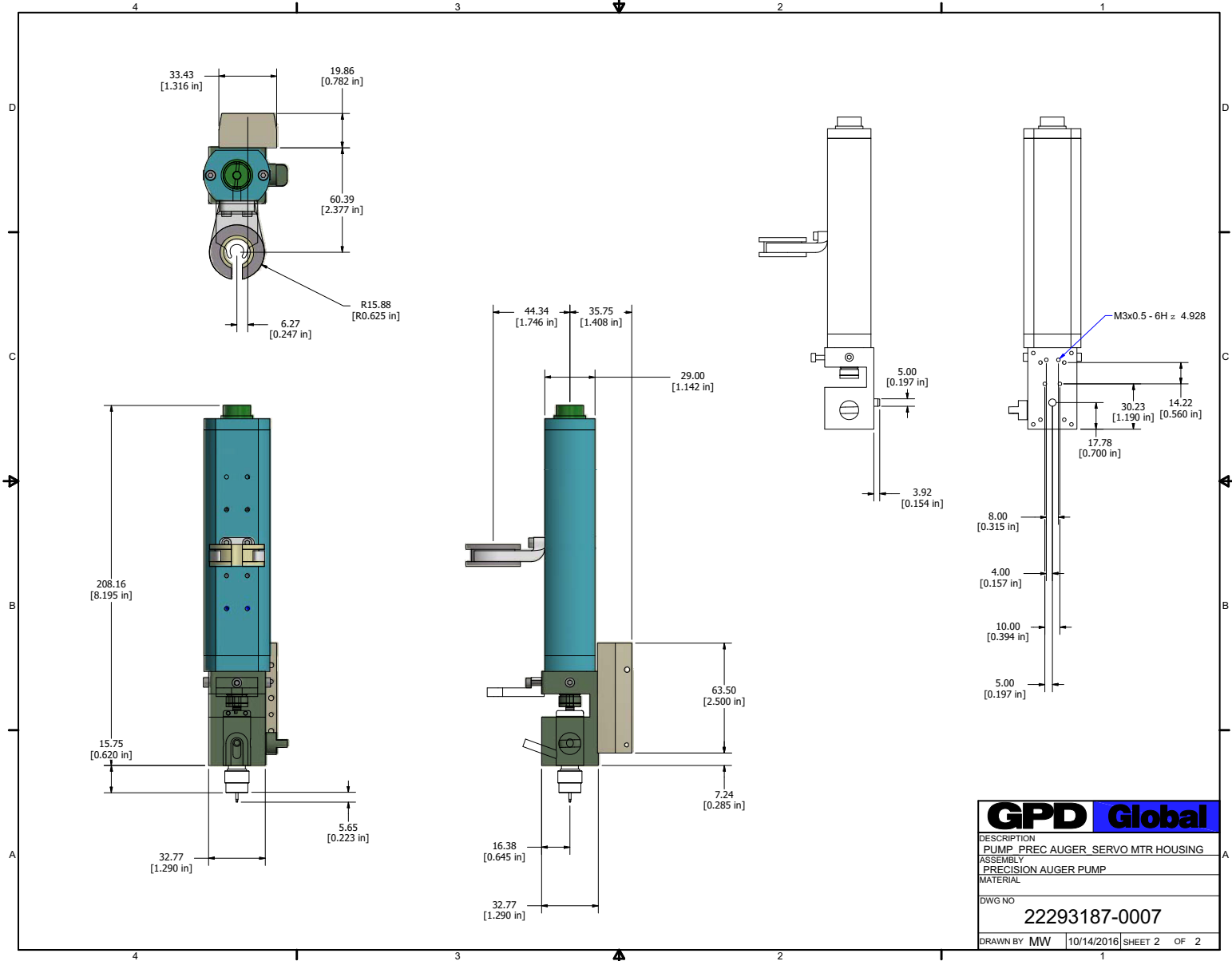
ASSEMBLY
PRECISION AUGER PUMP

MATERIAL
ASSEMBLY

DWG NO
22293187-0007

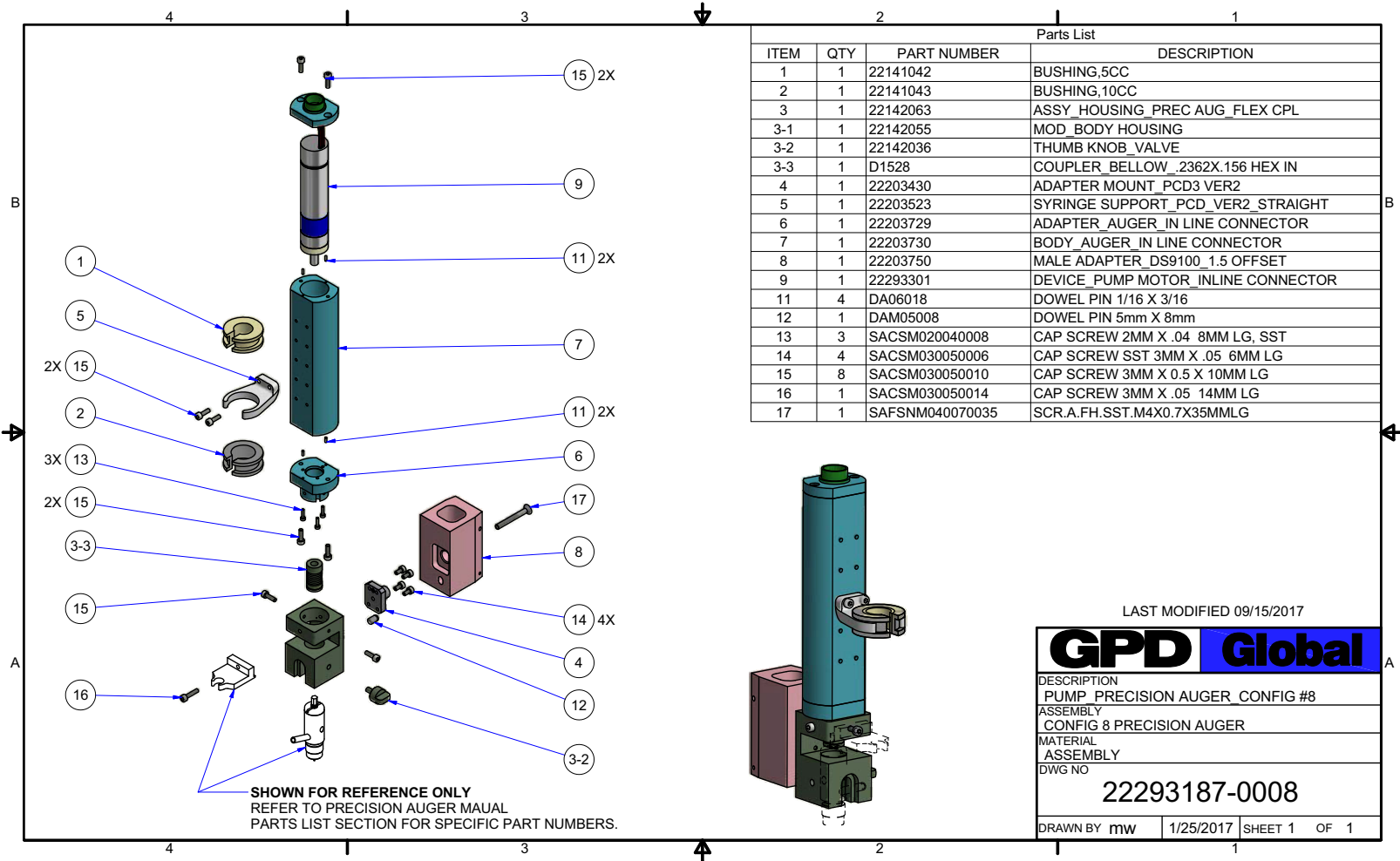
DRAWN BY MW 10/14/2016 SHEET 1 OF 1

22293187-0007 Dimensions for All Heated/Enclosed Motor Models

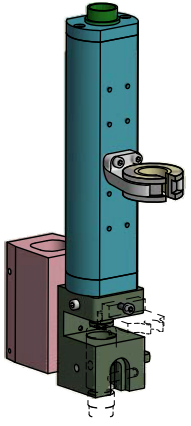


GPD Global	
DESCRIPTION PUMP PREC AUGER SERVO MTR HOUSING	
ASSEMBLY PRECISION AUGER PUMP	
MATERIAL	
DWG NO 22293187-0007	
DRAWN BY MW	10/14/2016 SHEET 2 OF 2

22293187-0008 Precision Auger pump - Servo Motor Housing, Offset



Parts List				
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	22141042	BUSHING,5CC	
2	1	22141043	BUSHING,10CC	
3	1	22142063	ASSY_HOUSING_PREC AUG_FLEX CPL	
3-1	1	22142055	MOD_BODY HOUSING	
3-2	1	22142036	THUMB KNOB_VALVE	
3-3	1	D1528	COUPLER_BELLOW .2362X.156 HEX IN	
4	1	22203430	ADAPTER MOUNT_PCD3 VER2	
5	1	22203523	SYRINGE SUPPORT_PCD_VER2 STRAIGHT	
6	1	22203729	ADAPTER_AUGER_IN LINE CONNECTOR	
7	1	22203730	BODY_AUGER_IN LINE CONNECTOR	
8	1	22203750	MALE ADAPTER_DS9100_1.5 OFFSET	
9	1	22293301	DEVICE_PUMP MOTOR_INLINE CONNECTOR	
11	4	DA06018	DOWEL PIN 1/16 X 3/16	
12	1	DAM05008	DOWEL PIN 5mm X 8mm	
13	3	SACSM020040008	CAP SCREW 2MM X .04 8MM LG, SST	
14	4	SACSM030050006	CAP SCREW SST 3MM X .05 6MM LG	
15	8	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG	
16	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG	
17	1	SAFSNM040070035	SCR.A.FH.SST.M4X0.7X35MMLG	



LAST MODIFIED 09/15/2017

GPD Global

DESCRIPTION
PUMP_PRECISION AUGER_CONFIG #8

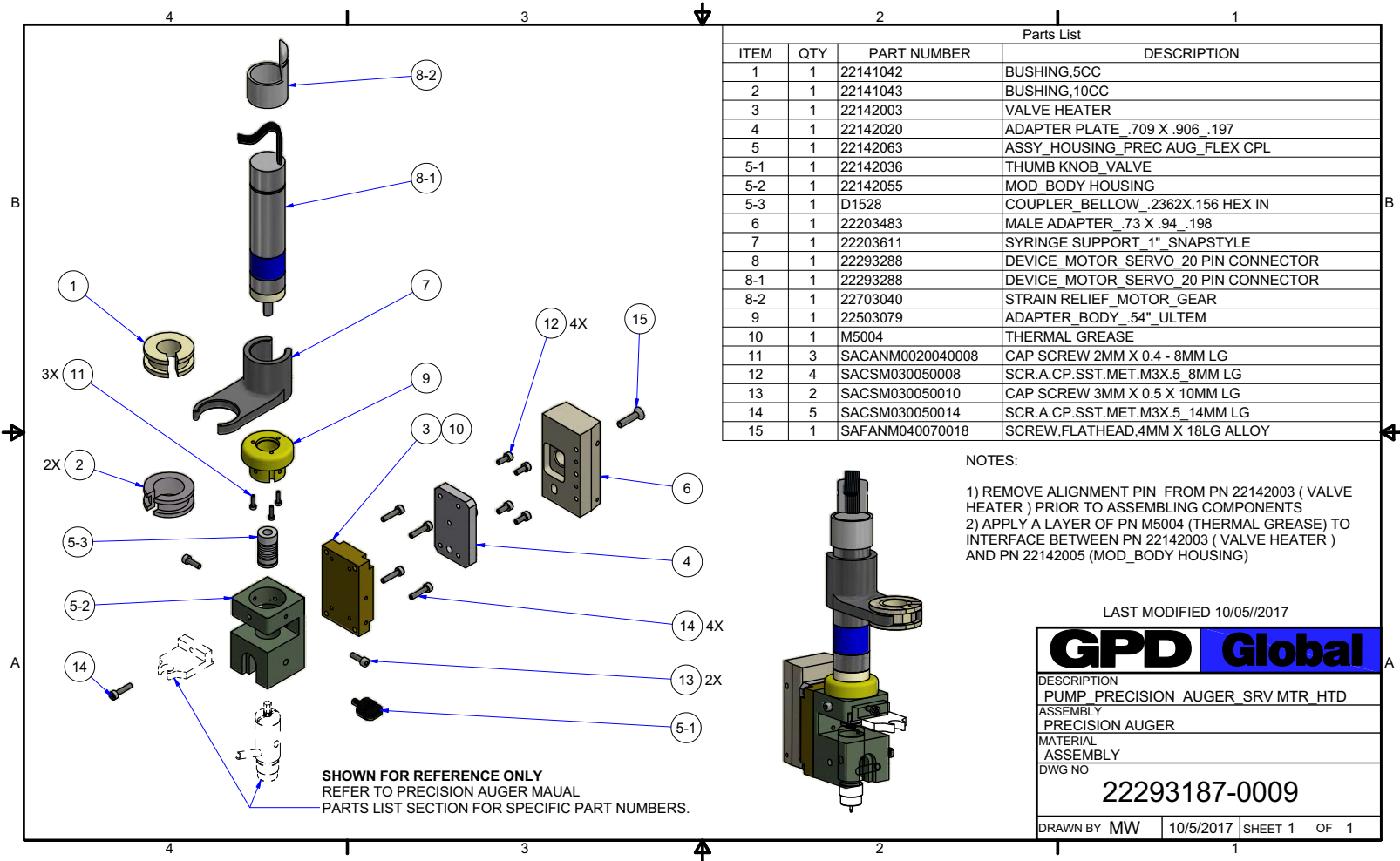
ASSEMBLY
CONFIG 8 PRECISION AUGER

MATERIAL
ASSEMBLY

DWG NO
22293187-0008

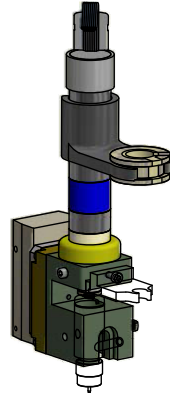
DRAWN BY mw | 1/25/2017 | SHEET 1 OF 1

22293187-0009 Precision Auger pump - Servo Motor, Heated



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22141042	BUSHING,5CC
2	1	22141043	BUSHING,10CC
3	1	22142003	VALVE HEATER
4	1	22142020	ADAPTER PLATE .709 X .906 .197
5	1	22142063	ASSY_HOUSING_PREC AUG_FLEX CPL
5-1	1	22142036	THUMB KNOB_VALVE
5-2	1	22142055	MOD_BODY HOUSING
5-3	1	D1528	COUPLER_BELLOW_.2362X.156 HEX IN
6	1	22203483	MALE ADAPTER_.73 X .94 .198
7	1	22203611	SYRINGE SUPPORT_1" SNAPSTYLE
8	1	22293288	DEVICE_MOTOR_SERVO_20 PIN CONNECTOR
8-1	1	22293288	DEVICE_MOTOR_SERVO_20 PIN CONNECTOR
8-2	1	22703040	STRAIN RELIEF_MOTOR_GEAR
9	1	22503079	ADAPTER_BODY_.54" ULTEM
10	1	M5004	THERMAL GREASE
11	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
12	4	SACSM030050008	SCR.A.CP.SST.MET.M3X.5_8MM LG
13	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
14	5	SACSM030050014	SCR.A.CP.SST.MET.M3X.5_14MM LG
15	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY

NOTES:
 1) REMOVE ALIGNMENT PIN FROM PN 22142003 (VALVE HEATER) PRIOR TO ASSEMBLING COMPONENTS
 2) APPLY A LAYER OF PN M5004 (THERMAL GREASE) TO INTERFACE BETWEEN PN 22142003 (VALVE HEATER) AND PN 22142055 (MOD_BODY HOUSING)



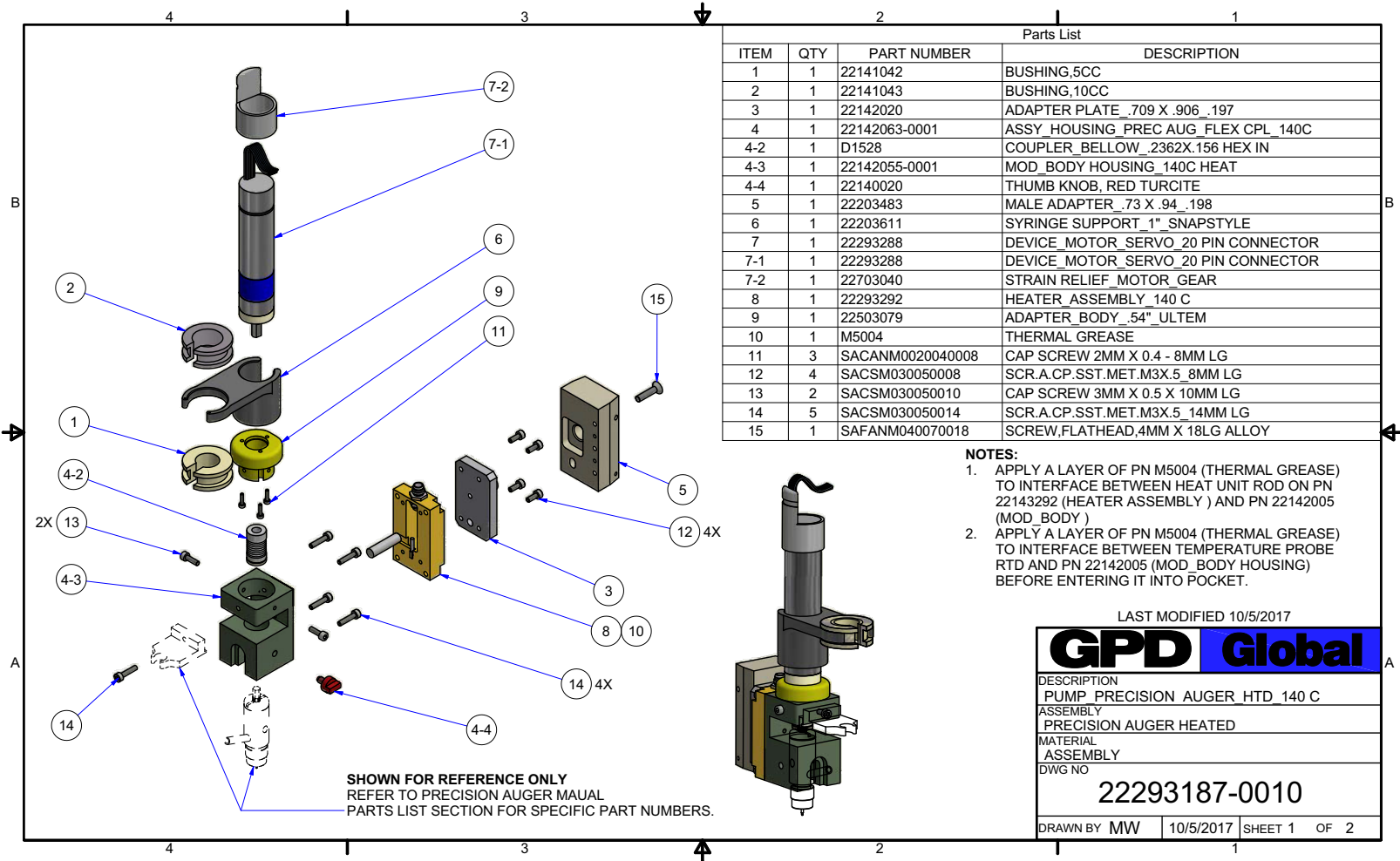
LAST MODIFIED 10/05//2017

GPD Global

DESCRIPTION
 PUMP_PRECISION AUGER_SRV MTR HTD
 ASSEMBLY
 PRECISION AUGER
 MATERIAL
 ASSEMBLY
 DWG NO
22293187-0009

DRAWN BY MW | 10/5/2017 | SHEET 1 OF 1

22293187-0010 Precision Auger pump - Servo Motor, Heated 140° C



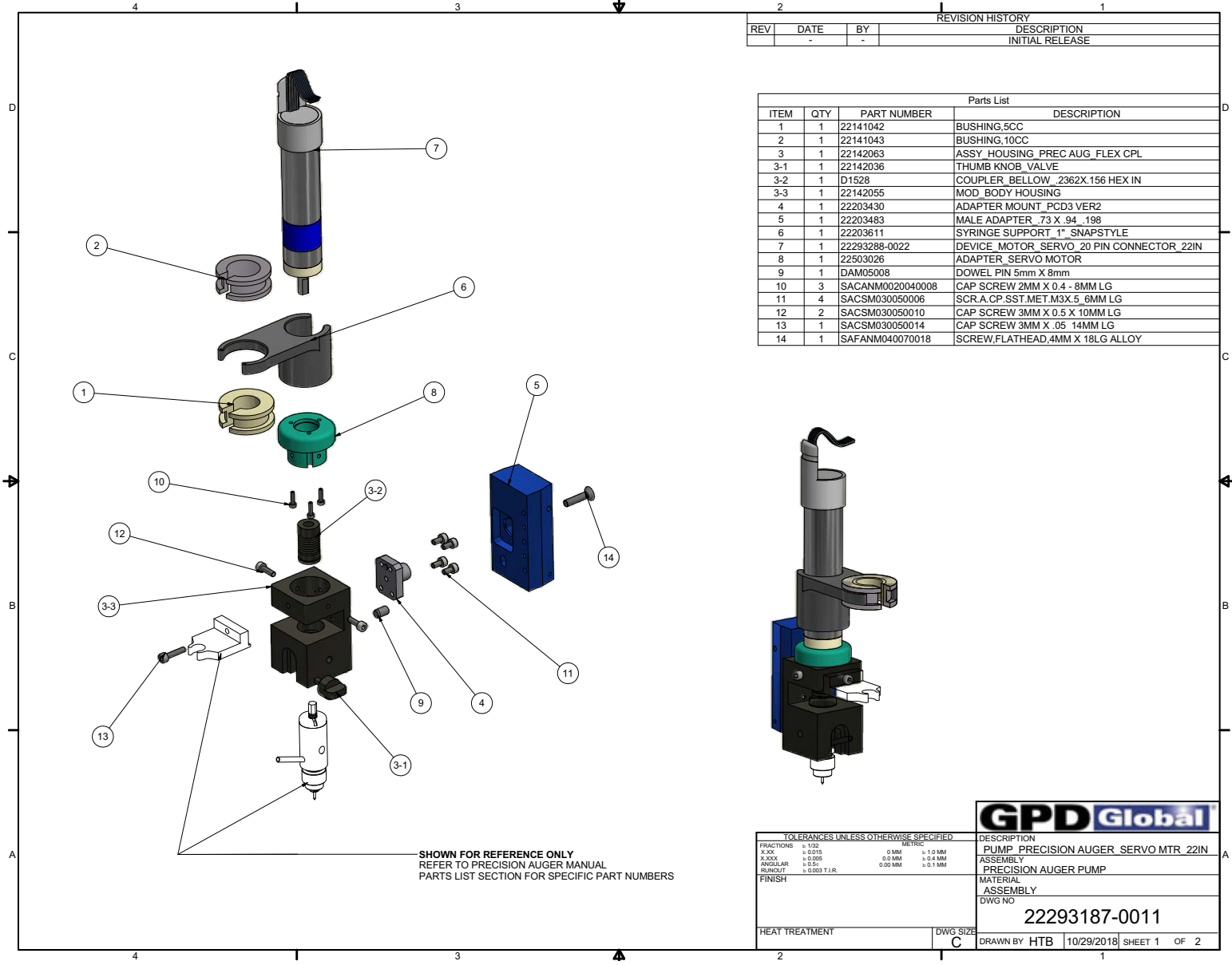
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22141042	BUSHING,5CC
2	1	22141043	BUSHING,10CC
3	1	22142020	ADAPTER PLATE .709 X .906 .197
4	1	22142063-0001	ASSY HOUSING PREC AUG FLEX CPL 140C
4-2	1	D1528	COUPLER BELLOW .2362X.156 HEX IN
4-3	1	22142055-0001	MOD_BODY HOUSING .140C HEAT
4-4	1	22140020	THUMB KNOB, RED TURCITE
5	1	22203483	MALE ADAPTER .73 X .94 .198
6	1	22203611	SYRINGE SUPPORT .1" SNAPSTYLE
7	1	22293288	DEVICE MOTOR SERVO 20 PIN CONNECTOR
7-1	1	22293288	DEVICE MOTOR SERVO 20 PIN CONNECTOR
7-2	1	22703040	STRAIN RELIEF MOTOR GEAR
8	1	22293292	HEATER ASSEMBLY 140 C
9	1	22503079	ADAPTER BODY .54" ULTEM
10	1	M5004	THERMAL GREASE
11	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
12	4	SACSM030050008	SCR.A.CP.SST.MET.M3X.5 .8MM LG
13	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
14	5	SACSM030050014	SCR.A.CP.SST.MET.M3X.5 .14MM LG
15	1	SAFANM040070018	SCREW,FLATHEAD,4MM X 18LG ALLOY

- NOTES:**
1. APPLY A LAYER OF PN M5004 (THERMAL GREASE) TO INTERFACE BETWEEN HEAT UNIT ROD ON PN 22143292 (HEATER ASSEMBLY) AND PN 22142005 (MOD_BODY)
 2. APPLY A LAYER OF PN M5004 (THERMAL GREASE) TO INTERFACE BETWEEN TEMPERATURE PROBE RTD AND PN 22142005 (MOD_BODY HOUSING) BEFORE ENTERING IT INTO POCKET.

LAST MODIFIED 10/5/2017

GPD Global	
DESCRIPTION	
PUMP PRECISION AUGER HTD 140 C	
ASSEMBLY	
PRECISION AUGER HEATED	
MATERIAL	
ASSEMBLY	
DWG NO	
22293187-0010	
DRAWN BY MW	10/5/2017 SHEET 1 OF 2

22293187-0011 Precision Auger pump - Servo Motor, 22" Cable



SHOWN FOR REFERENCE ONLY
REFER TO PRECISION AUGER MANUAL
PARTS LIST SECTION FOR SPECIFIC PART NUMBERS

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	INITIAL RELEASE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22141042	BUSHING,5CC
2	1	22141043	BUSHING,10CC
3	1	22142063	ASSY HOUSING PREC AUG FLEX CPL
3-1	1	22142036	THUMB KNOB VALVE
3-2	1	D1528	COUPLER BELLOW .2362X.156 HEX IN
3-3	1	22142055	MOD BODY HOUSING
4	1	22203430	ADAPTER MOUNT_PCD3 VER2
5	1	22203483	MALE ADAPTER .73 X .94 .198
6	1	22203611	SYRINGE SUPPORT 1" SNAPSTYLE
7	1	22293288-0022	DEVICE MOTOR SERVO .20 PIN CONNECTOR 22IN
8	1	22503026	ADAPTER_SERVO MOTOR
9	1	DAM05008	DOWEL PIN 5mm X 8mm
10	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
11	4	SACSM030050006	SCR.A.CP.SST.MET.M3X.5 .6MM LG
12	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
13	1	SACSM030050014	CAP SCREW 3MM X .05 14MM LG
14	1	SAFANM040070018	SCREW.FLATHEAD,4MM X 18LG ALLOY

TOLERANCES UNLESS OTHERWISE SPECIFIED	
FRACTIONS	DECIMALS
X.XX	± 0.15
X.XXX	± 0.05
ANGULAR	± 0.5°
RADIUS	± 0.003 T.R.

GPD Global	
DESCRIPTION	
PUMP PRECISION AUGER SERVO MTR 22IN	
ASSEMBLY	
PRECISION AUGER PUMP	
MATERIAL	
ASSEMBLY	
DWG NO	
22293187-0011	
HEAT TREATMENT	DWG SIZE
	C
DRAWN BY HTB	10/29/2018
SHEET 1	OF 2

Warranty

General Warranty. Subject to the remedy limitation and procedures set forth in the Section “Warranty Procedures and Remedy Limitations,” GPD Global warrants that the system will conform to the written description and specifications furnished to Buyer in GPD Global’s proposal and specified in the Buyer’s purchase order, and that it will be free from defects in materials and workmanship for a period of one (1) year. GPD Global will repair, or, at its option, replace any part which proves defective in the sole judgment of GPD Global within one (1) year of date of shipment/invoice. Separate manufacturers’ warranties may apply to components or subassemblies purchased from others and incorporated into the system. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Limitations. GPD Global reserves the right to refuse warranty replacement, where, in the sole opinion of GPD Global the defect is due to the use of incompatible materials or other damages from the result of improper use or neglect.

This warranty does not apply if the GPD Global product has been damaged by accident, abuse, or has been modified without the written permission of GPD Global.

Items considered replaceable or rendered unusable under normal wear and tear are not covered under the terms of this warranty. Such items include fuses, lights, filters, belts, etc.

Warranty Procedures and Remedy Limitations. The sole and exclusive remedy of the buyer in the event that the system or any components of the system do not conform to the express warranties stated in the Section “Warranties” shall be the replacement of the component or part. If on-site labor of GPD Global personnel is required to replace the non-warranted defective component, GPD Global reserves the right to invoice the Buyer for component cost, personnel compensation, travel expenses and all subsistence costs. GPD Global’s liability for a software error will be limited to the cost of correcting the software error and the replacement of any system components damaged as a result of the software error. In no event and under no circumstances shall GPD Global be liable for any incidental or consequential damages; its liability is limited to the cost of the defective part or parts, regardless of the legal theory of any such claim. As to any part claimed to be defective within one (1) year of date of shipment/invoice, Buyer will order a replacement part which will be invoiced in ordinary fashion. If the replaced part is returned to GPD Global by Buyer and found by GPD Global in its sole judgment to be defective, GPD Global will issue to Buyer a credit in the amount of the price of the replacement part. GPD Global’s acceptance of any parts so shipped to it shall not be deemed an admission that such parts are defective.

Specifications, descriptions, and all information contained in this manual are subject to change and/or correction without notice.

Although reasonable care has been exercised in the preparation of this manual to make it complete and accurate, this manual does not purport to cover all conceivable problems or applications pertaining to this machine.