Extrusion Head SMH – 2

Compatible with:

■ HYDRA Floor Model ■ HYDRA Bench Model ■ System 30M ■ Engine ■ Engine HD

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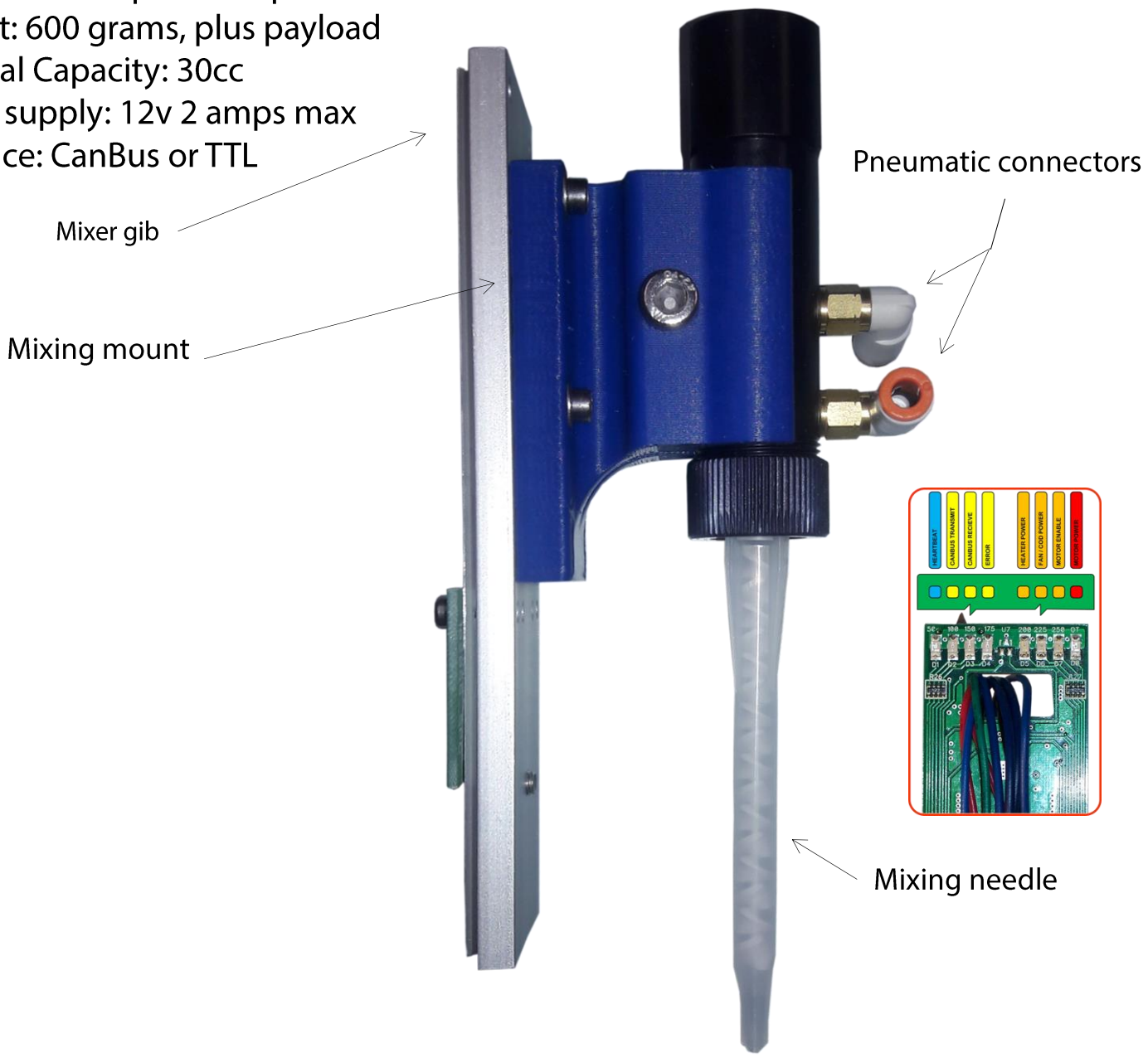
Specifications:

Programmable start/stop dwell in milliseconds
Programmable prime/unprime in nanoliters
Weight: 600 grams, plus payload
Material Capacity: 30cc
Power supply: 12v 2 amps max
Interface: CanBus or TTL



Nozzles:

The SDS series of print heads use standard syringes, with standard luer fittings.

Use the following syringes from BD Inc. for SDS, CSD, HSD, and CMS heads:
5cc 309646
10cc 309604
30cc 302832
60cc 309653

You will need to prepare your syringe by clipping off one of the ears (see video https://www.youtube.com/watch?v=ej55bZXrltA) to allow it to be loaded properly into the syringe holder.

Make sure that when filling your syringe with material, you do not have any air inside. This will greatly affect the print quality.

Theory of Operation:

The SDS series of extruders is designed to allow emulisified, low viscosity materials to be dispensed (printed), in a controlled way. The number of actual possible materials is vast, but we will list a few of our favorite materials to give you an idea: RTV Silicone clear, High Temp RTV, bio gels, epoxy, water....

While it is possible to print with food products, we do NOT recommend it, due to the difficulty of insuring sanitary conditions.

The SDS series of extruder heads all have smart controllers, and up to four heads can be loaded in a Hyrel printer at a time. This allows mixing of materials, or parallel printing of high volume small parts.

The syringe is loaded with the desired material, taking care not to get air inside the cylinder. The cylinder is loaded into the syringe clamp, loading the syringe plunger handle into the drive cradle. If you need to move the cradle, use the manual override switch, located at the top of the head controller, above the blinking leds.

The drive motor will turn at the desired rate when printing. The drive speed is controlled by head settings and the actual linear velocity of the print head, as set by the F argument in the G1, G2 or G3 commands. Generally speaking, you can print with the same code that you print plastic with, as long as the temperature and speed are set appropriately and the nozzle diameter is the same.

Using the SMH-2:

It is good to use RTV, (from your local hardware store), to learn with.
Vaseline is also easy to use, but it will not get firm after printing.

Basically:
1. Load your material into the syringes
2. Mount the SDS head on your printer yoke,
3. Check the Z at the end of the needle on the syringe.
4. Load your G-Code file.
5. Print

We do NOT recommend printing food with the SDS. Just because it can be done does not mean that it should be done.

Once the head is installed, the syringes can be changed without removing the head from the yoke. If you use care, this will make it fast and easy to swap out materials.

You can use the M0 code to insert cylinder change stops (pauses) in your program.

Example:

```
G0 X0 Y200 ; move to material change location
M0   ; Install new material then press continue
```

Additional Help:
Check our YouTube channel and look for key words “Hyrel”,”3DS”, “Syringe”, and “Silicone”, for helpful videos.

Tips:

Use fresh syringes and tips to avoid contamination.

NO AIR should be inside the SDS Print Head. Pack your syringes carefully; it will make the material delivery spongy, and a crisp start and stop will be impossible.

NEVER put flammable material, such as gasoline, in your syringes.

ALWAYS USE good ventilation when using the syringes. Many of the more interesting materials will emit toxic fumes.

Maintenance:

Keep your SDS head clean. Do not allow material to get on the linear bearing or drive screw.

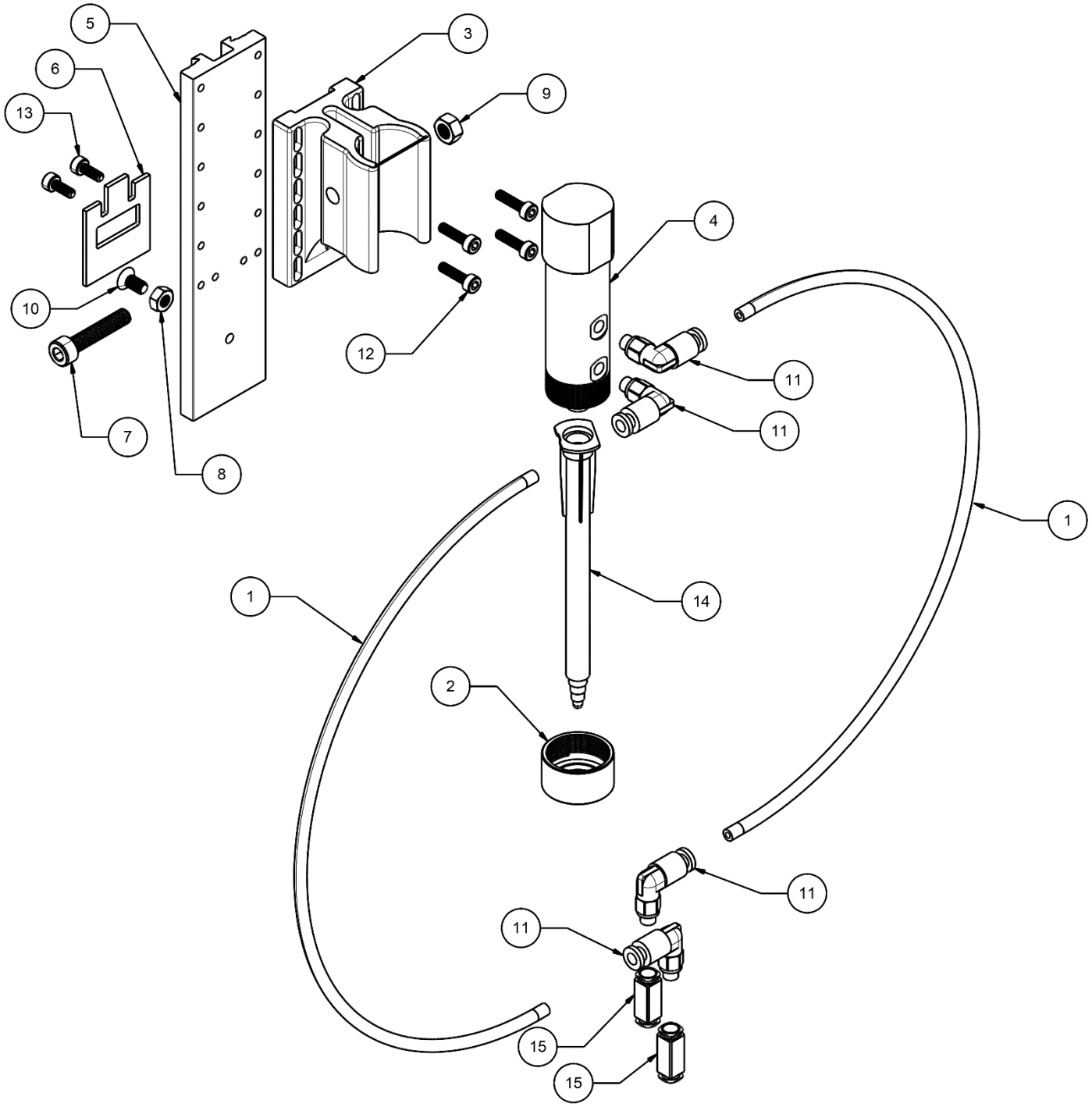
Use care when Installing the head into the yoke. Due to its long format, it is possible to mis-align the connection point.

Disclaimer:

!!! Use at your own risk. !!!

No warranty or guarantee is offered for the application of this product. The user agrees to be ENTIRELY responsible for the safe operation of this product.

SMH-2 Exploded View



SMH-2 BOM

Item	Qty.	Part #	Part Name
1	2	1000095	1000095 PTFE Tube 2mmID 4mmOD
2	1	102032-1	102032-1 Tube Nut
3	1	102437-2	102457-2 Mixer Mount v3
4	1	102447-2-1	102447-2-1 2-part Mixing Manafold Body v3
5	1	102448	102448 Mixer Gib From Extrusion
6	1	102508	102508.PCBSpacerStop.H3D
7	1	200070-25	200070-25.M5x25.SocketCap.92290A252
8	1	200098	200098 M4 Hex Nut.90592A011
9	1	200099	200099.M5.HexNut.90592A012
10	1	200108-8	200108-8.M4x8.Flat.Phillips.92010A218
11	4	200141-4R	200141-4R Right Angle Pneumatic Fitting
12	4	200303-12	200303-12.Screw,M3x12mm,SocketCap
13	2	200303-8	200303-8.Screw,M3x8mm,SocketCap
14	1	200515	200515 - Mixing Needle
15	2	201015-10	201015-10 Tapped F-F Luer Tip Adapter 51465K145

The M106 command, used to control the fan which cools deposited material on the MK-series heads, controls the UV LED array on crosslinking heads. This functionality is the same on all CSD heads, as well as the COD, VCD, and KCD heads.

M106 T# S0 ; sets the COD LEDs (or fan) to 0% (off)

M106 T# S25 ; sets the COD LEDs (or fan) to 25%

M106 T# S100 ; sets the COD LEDs (or fan) to 100%

Note: T#, where # can be any of the following:

10 for yoke 1, ALL heads; or

11 for yoke 1, head 1; or

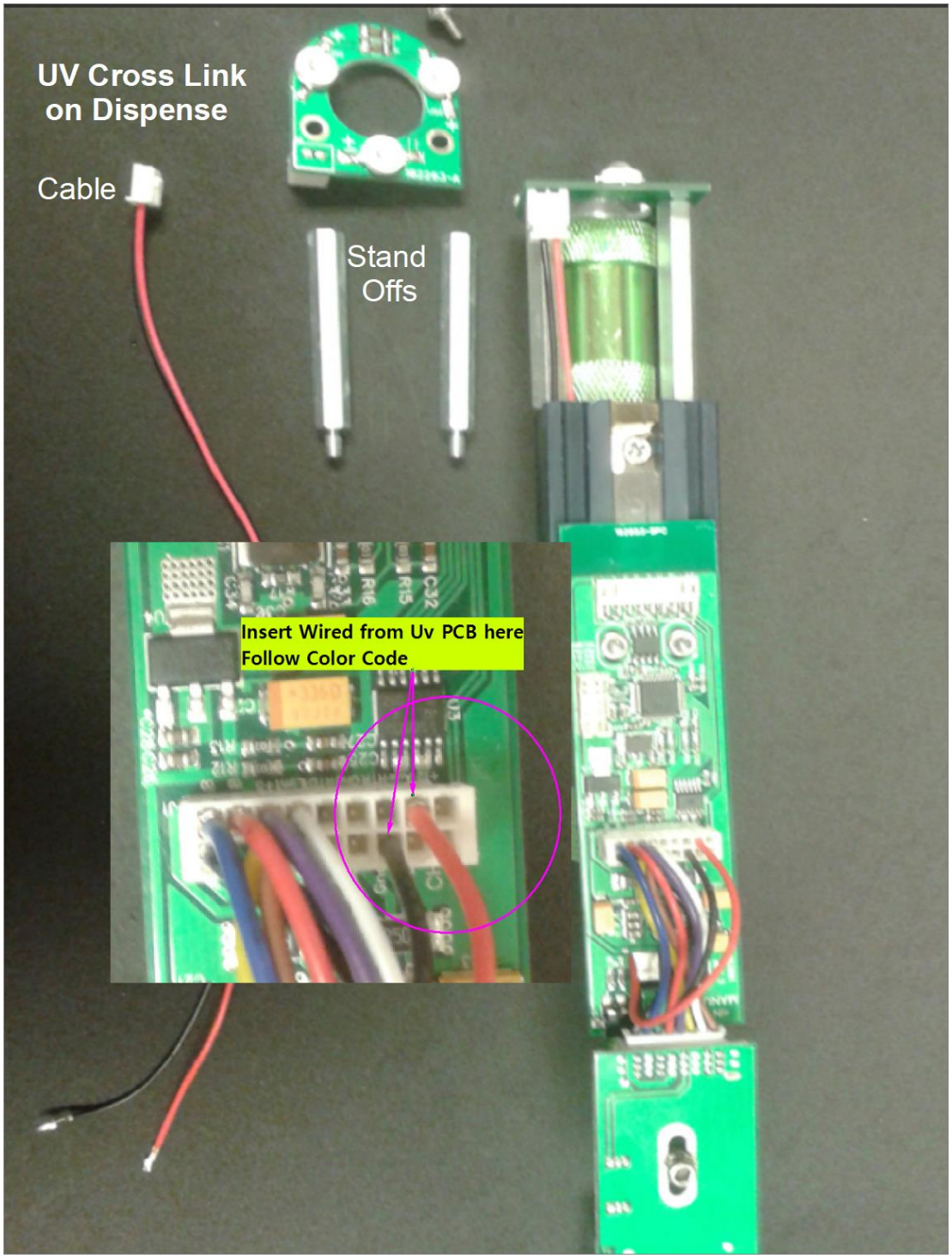
12 for yoke 1, head 2; or

13 for yoke 1, head 3; or

14 for yoke 1, head 4; or

15 for yoke 1, head 5; or

Left blank, to address the “currently active” head.


UV Cross Link
on Dispense
Cable
Stand
Offs
Insert Wired from Uv PCB here
Follow Color Code